



# THE NETWORK. INTUITIVE.

Constantly learning, constantly adapting, constantly protecting  
Built on Cisco DNA



## Cisco Enterprise Networks Catalog Volume 5:

Europe, Middle East, Africa and Russia

[www.cisco.com/go/DNA](http://www.cisco.com/go/DNA)  
#networkintuitive







Cisco Catalog - EMEAR  
Vol.5

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# THE NETWORK. INTUITIVE.

## A network that knows what you want and does it

Ushering in a new era in networking, built on Cisco® Digital Network Architecture (Cisco DNA™).

**Intent-based networking** is the difference between a network that needs continuous attention and one that simply understands what you need and makes it happen. It's the difference between doing thousands of tasks manually and having an automated system that helps you focus on business goals.

Cisco DNA is the open, software-driven platform that turns vision into reality. Virtualization, automation, analytics, and cloud, all in one architecture.



### Constantly learning

Speed, simplicity and visibility  
Reduced cost and complexity



### Constantly adapting

New business models  
Faster innovation



### Constantly protecting

Real-time and dynamic threat defense  
Lower risk

## The intuitive network. It's built to evolve as you do.

The new network is informed by context, is powered by your intent, and grows more intuitive every day. And when it's built on intent-based networking solutions of the Cisco Digital Network Architecture (DNA), suddenly your network doesn't slow you down. In fact, it helps you deliver better experiences, more security. So IT can quickly respond to the demands of your business.

### CONTEXT

The new network interprets who, what, when, where, and how—resulting in better security, more customized experiences, and faster operations.

### INTENT

The new network automatically translates intentions into the right network configuration, so you can manage and provision millions of devices in minutes.

### INTUITIVE

The new network continually learns from the massive amounts of data flowing through Cisco networks and turns that data into actionable, predictive insights.



# Introducing an entirely new era of networking.

The Network.  
Intuitive.  
Built on Cisco DNA.

Cisco Digital Network Architecture (DNA) delivers intent-based networking solutions and services that turn network traffic data into actionable insights. It helps to make business decisions faster, mitigate more security threats, and manage the unprecedented scale of connected devices and services more easily.

## Cisco DNA guiding principles

- **Security everywhere**, turning the network into a sensor and enforcer for an extensive vantage point to identify risk and threats
- **Cloud service managed** to design, provision, enable policy, and assure network services through centralized management
- **Designed for automation** to fully automate the network infrastructure based on one policy across the access network, acting as a single fabric
- **Pervasive analytics** to proactively predict performance through machine learning and correlations for actionable business and operational insights for users, devices, and applications
- **Virtualizing everything** to connect users to applications with one seamless network and deploy network services in minutes on any platform
- **DNA-ready infrastructure** to make sure all your switches, routers, and access points can support the DNA software innovations today and into the future

## DNA software capabilities



Cloud service management



Automation

Analytics



Virtualization

DNA-ready physical and virtual infrastructure



Security

Below a summary of the new solutions we have introduced:



## Software

**DNA Center** is a better way to manage a network. It offers centralized, intuitive management that make it fast and easy to design, provision, and apply policy across an entire network environment.

**Software-Defined Access.** Industry's first policy-based automation from the edge to the cloud takes a logical policy-based approach that deploys and secures services faster and adapts to changes quicker.

**Analytics and Assurance** abstracts network insights by collecting data from the network and then identifies service impacting issues before users do while enabling faster troubleshooting.

**Encrypted Traffic Analytics** enhances the ability of the Cisco network to act as a sensor and uncovers threats hidden in encrypted traffic using network analytics (without decryption). These threats are viewed within the Stealthwatch Management Console. ETA enhances the ability of the Cisco network to act as a sensor.



## Hardware

To support these innovations, we are also releasing new physical infrastructure components that are designed to release the total value of a digital-ready architecture.

**Cisco Catalyst 9000 Series** is the first purpose-built platform designed for Cisco DNA. An open and programmable platform with integrated support for wireless and IoT devices. It extends our existing wireless, switch and routing DNA-ready infrastructure.



# Cisco Software-Defined Access

Introducing an entirely new era in networking. The Network. Intuitive.

Cisco® Software-Defined Access (SD-Access), built on the principles of the Cisco Digital Network Architecture (Cisco DNA™), provides a transformational shift in building and managing networks: faster, easier and with improved business efficiency. By decoupling network functions from hardware, SD-Access helps ensure policy consistency, enables faster launches of a new business services and significantly improves issue resolution times while being open and extensible and reducing operational expenses.

Digital transformation is forcing enterprises to search for new ways to enable digital capabilities, deliver IT services and manage assets. We're moving toward a very different world. We need a very different network to get us there.

## Benefits

- **Secure your organization and achieve regulatory compliance** with end-to-end segmentation that keeps user, device and application traffic separate without redesigning the network
- **Improve the workforce experience** by automating user access policy and applying the right policies for users or devices to any application across the network
- **Boost operational effectiveness** by enabling a consistent user experience anywhere without compromise – all with a single network fabric



# What does SD-Access do?



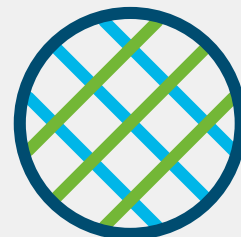
## End-to end segmentation

Secure users, devices, and applications with identity-based policy, regardless of location.



## Simple, automation work flows

Design, provision, and manage your wired and wireless networks.



## Intelligent network fabric

Enable a consistent user experience anywhere with insights and analytics into user and application behavior.

## Reduce operational expenses and increase business agility

Why does a digital enterprise need SD-Access? Several studies have shown that over \$60 billion is being spent on IT operations (in-house and outsourced).

**Network deployment** challenges include complexity in network provisioning, difficulty in securing the entire network and inconsistency among disparate networks.

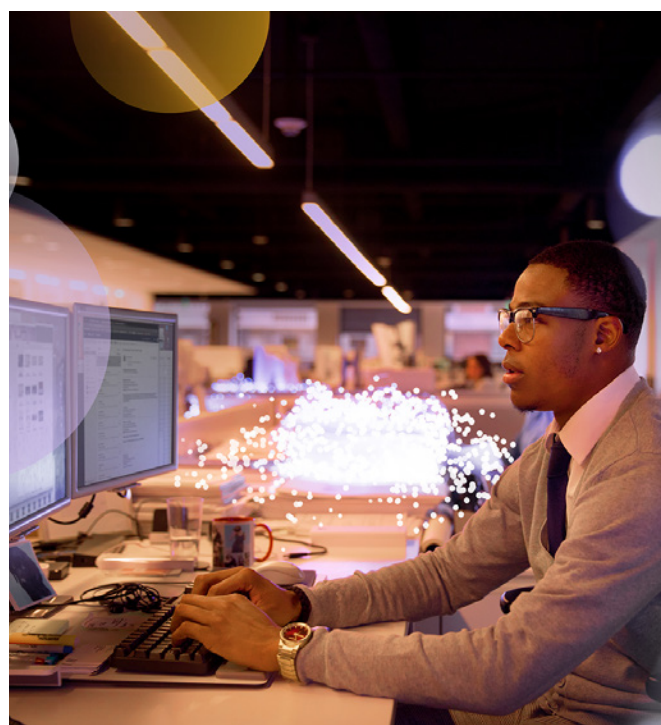
**Network operations** challenges include outdated change management tools, difficulty in maintaining productivity and slow issue resolution.

SD-Access helps organizations address these challenges by enabling policy-based automation from the edge to the cloud. It is built on industry leading software and hardware elements to provide next-generation capabilities and investment protection for existing deployments.

Network architects and administrators will now have the tools to orchestrate key business functions, such as user mobility, secure segmentation, user onboarding, Internet of Things (IoT) integration, guest access, context based troubleshooting and data center and cloud integration.

Administrators can also now execute full network lifecycle tasks, including design, provisioning and operations with Cisco DNA Center.

Enable network access in minutes for any user or device to any application without compromising on security - with Cisco SD-Access.



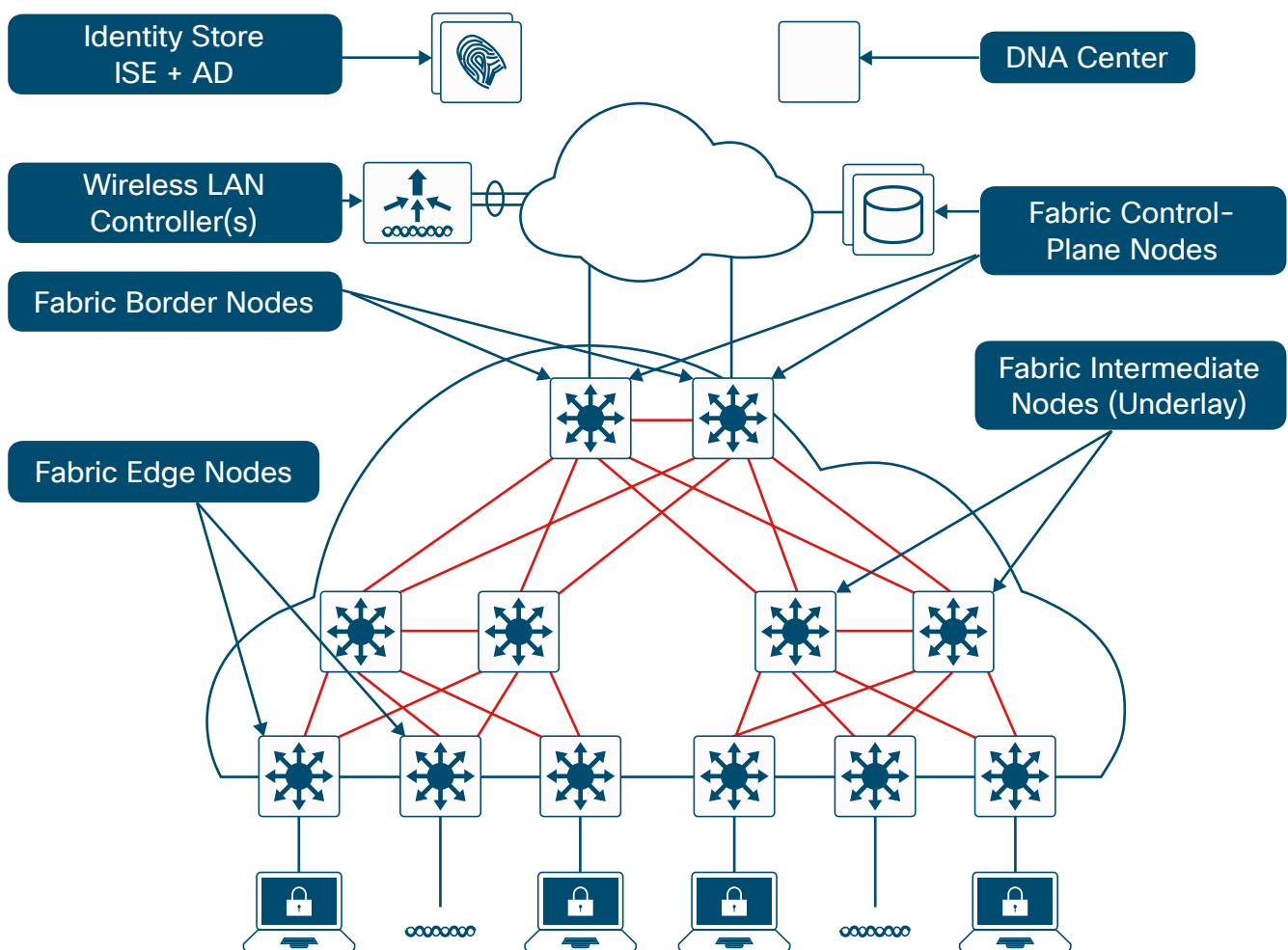
# Cisco's Software Defined Access solution?

Cisco's Software-Defined Access (SD-Access) architecture is the Cisco DNA evolution from traditional campus LAN designs. SD-Access uses DNA Center for designing, provisioning, applying policy, and providing campus wired and wireless network assurance for an intelligent network. Campus fabric technology, an integral part of SD-Access, introduces programmable overlays enabling easy-to-deploy network virtualization

across the wired and wireless campus. In addition to network virtualization, campus fabric technology provides software-defined segmentation and policy enforcement based on user identity and group membership. Software-defined segmentation is seamlessly integrated using Cisco TrustSec technology, providing micro-segmentation through the use of scalable groups within a virtual network.

## SD-Access Components

The SD-Access solution combines the DNA Center enterprise controller, identity services, and wired and wireless fabric functionality. Within the SD-Access solution, the fabric is composed of fabric control plane nodes, edge nodes, intermediate nodes, and border nodes. Wireless integration adds fabric WLC and fabric mode AP components.







## SD-Access Platforms support

This solution supports both current and next-generation network devices, including routers, switches, wireless controllers, and access points. Table 1 summarizes the platforms supported. For a more detailed information you can check the SD-Access Ordering Guide (<http://cs.co/rp1113a>) and the SD-Access CVD (<http://cs.co/rp1113b>)

Table 1. SD-Access Platform Support Summary

Fabric edge	Cisco Catalyst 9300 Series Switches Cisco Catalyst 9400 Series Switches (Sup1) Cisco Catalyst 3850 Series and 3650 Series Switches Cisco Catalyst 4500E Series Switches (Sup8E, Sup9E)
Fabric border and control plane	Cisco Catalyst 9500 Series Switches Cisco Catalyst 3850 Series Fiber Module Cisco Catalyst 6807-XL Switch (Sup6T, Sup2T) Cisco Catalyst 6500 Series Switches Cisco Catalyst 6880-X Switch Cisco Catalyst 6840-X Switch Cisco Nexus® 7700 Switch (Sup 2E, M3 line cards only) Cisco 4000 Series Integrated Services Routers Cisco ASR 1000 Series Aggregation Services Routers Cisco Cloud Services Router 1000v (control plane only)
Extended SD-Access	Cisco Catalyst 3560-CX Series Cisco Catalyst Digital Building Series Switches
SD-Access wireless	802.11 Wave 2 access points: Cisco Aironet® 1800, 2800, and 3800 Series 802.11 Wave 1 access points: Cisco Aironet® 1700, 2700, and 3700 Series Cisco 3504, 5520, 8510 and 8540 Series Wireless Controllers

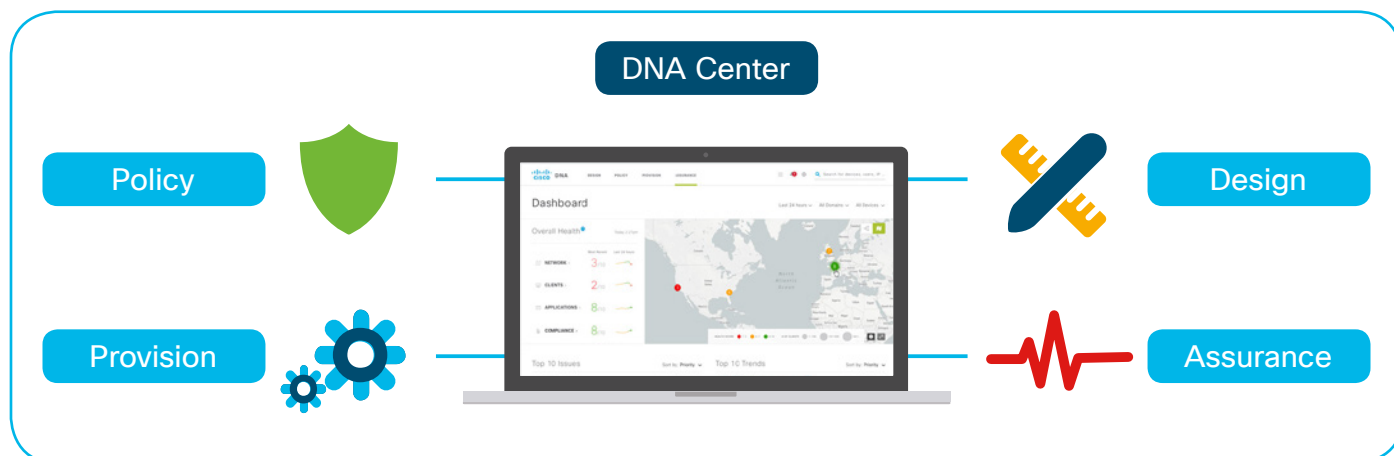
**Note:**

- Wave 1 access points won't support the following functions when deployed for SD-Access: IPv6, Application Visibility and Control (AVC), NetFlow.
- A device cannot act as fabric edge and fabric border at the same time.
- A device can act as fabric border and fabric control plane at the same time.

# Cisco DNA Center

DNA Center is the latest solution that Cisco recently announced as part of the Network. Intuitive. It provides a single command and control for the network automation and provisioning tasks. DNA Center also provides a built-in analytic engine called Assurance that uses network insights to optimize network performance.

Your network infrastructure is the enabler for digital transformation and crucial to your organization's success. Cisco® Digital Network Architecture (DNA) Center is a centralized management application for your network. DNA Center simplifies network management so IT can move more quickly, using automation to lower costs, assurance and analytics to improve network performance, and security to reduce risk.



Cisco DNA Center can manage your end-to-end network from the campus, branch, and WAN to the cloud. It runs on Cisco's Software-Defined Networking (SDN) controller, the DNA Center. Using intuitive workflows, DNA Center makes it easy to design, provision, and apply policy across your network. It also delivers end-to-end visibility and uses network insights to optimize network performance and deliver the best user and application experience.

## Benefits

- Simplify network management. Manage your enterprise network over a centralized dashboard.
- Deploy networks in minutes, not days. Using intuitive work flows, DNA Center makes it easy to design, provision, and apply policy across your network.
- Reduce human error. Policy-driven automation reduces downtime and improves security.
- Predict problems before they happen. Analytics and assurance use network insights to optimize network performance and deliver the best user and application experience.

For more information please see the DNA Center section on page 92



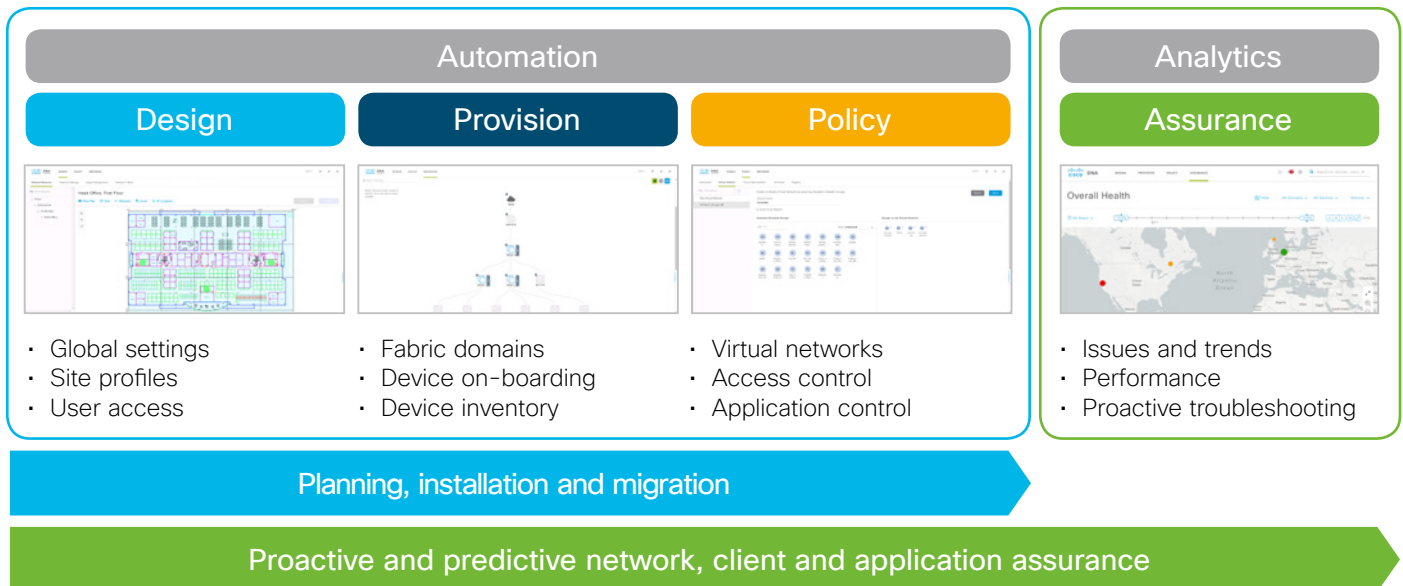


# DNA Analytics and Assurance (built-in as an application inside DNA Center)

Cisco Digital Network Architecture (DNA) Analytics and Assurance helps you get the most from your network. The solution proactively monitors your network, gathering and processing information from your devices, applications and users and presenting it in Cisco DNA Center, an easy-to-use single dashboard for managing all your analytics tasks.

The insights you gather from your network devices can influence your automation configuration and deployment decisions. Cisco DNA Center provides an integrated automation and assurance/analytics workflow, enabling you to quickly take action to remediate the issue. Think of it as a closed feedback loop.

## DNA Center and Assurance



### Cisco DNA Analytics and Assurance delivers three key values for IT:

#### 1. Troubleshooting

Analytics and Assurance correlates network information so it's easier and faster to identify faults and subsequently perform a root cause analysis of an issue. Cisco domain expertise informs the correlations as well as the remediation options.

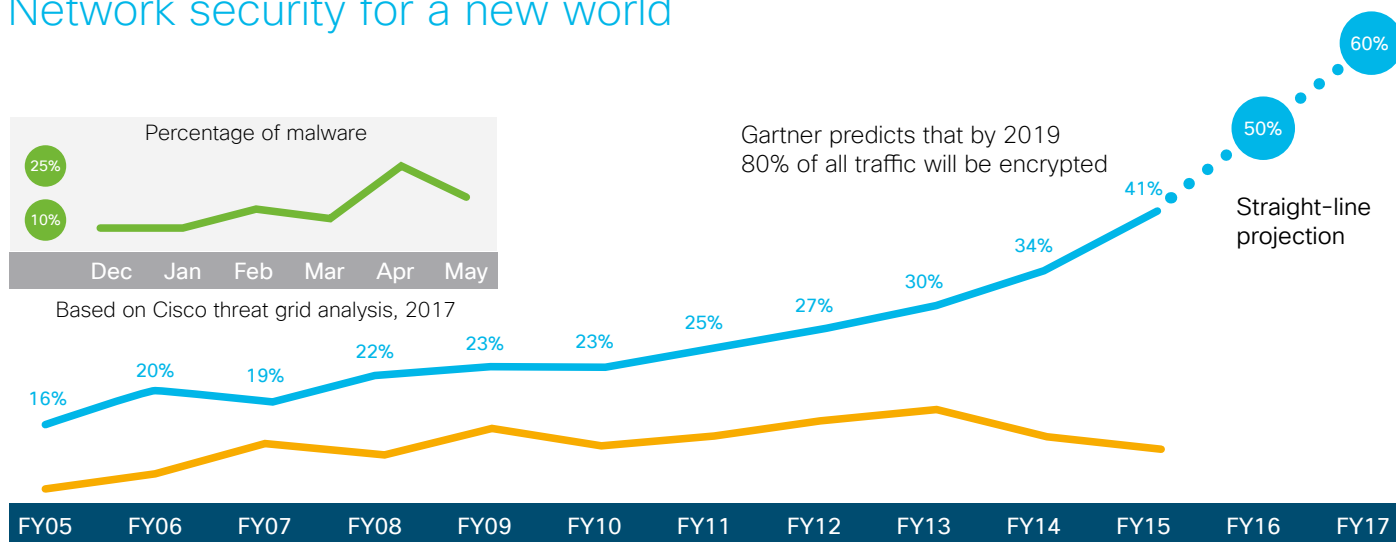
#### 2. Predictive, Proactive Performance Optimization

The solution uses machine learning to uncover trends that may affect future performance. By proactively identifying potential issues, IT can mitigate hazards before they impact user network experience. In fact, they can ensure that the network is always running at optimal performance even if there are no reported issues.

#### 3. Analytic Insights Delivered To Cisco DNA Center For Closed-Loop Automation

By integrating with Cisco DNA™ automation, Cisco is laying the foundation for the self-driving network. When fully integrated, Analytics and Assurance collects data from the network infrastructure, determines a course of action based on the mined insights, and ultimately directs automation to take action back to the network itself. It's a cycle that can free up IT teams to focus on strategic plans instead of routine maintenance.

# Cisco Encrypted Traffic Analytics (ETA) - Network security for a new world



The rapid rise in encrypted traffic is changing the threat landscape. As more businesses become digital, a significant number of services and applications are using encryption as the primary method of securing information. More specifically, encrypted traffic has increased by more than 90 percent year over year, with more than 40 percent of websites encrypting traffic in 2016 versus 21 percent in 2015. Gartner predicts that by 2019, 80 percent of web traffic will be encrypted.

Source: *Thales and Vormetric*

Encryption technology has enabled much greater privacy and security for enterprises that use the Internet to communicate and transact business online. Mobile, cloud and web applications rely on well-implemented encryption mechanisms, using keys and certificates to ensure security and trust. However, businesses are not the only ones to benefit from encryption. Threat actors have leveraged these same benefits to evade detection and to secure their malicious activities.

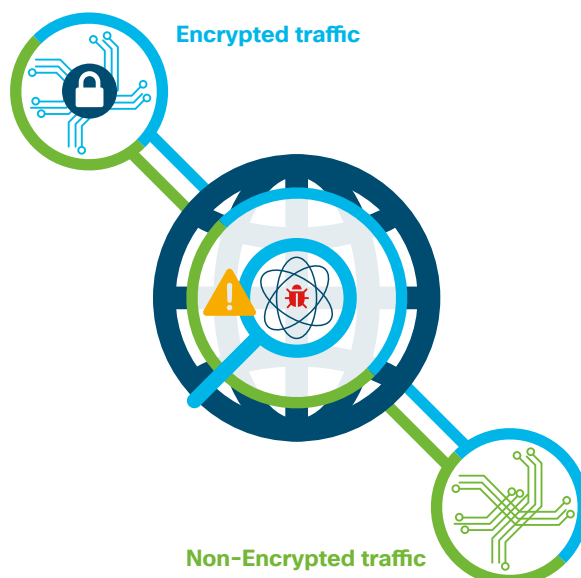
The majority of organizations today do not have a solution to detect malicious content in encrypted traffic. They lack the security tools and resources to implement a solution that can be deployed throughout their network infrastructure without slowing down the network.

Cisco as part of the Network. Intuitive. announcement, shared the Industry's first network with the ability to find threats in encrypted traffic **without decryption**.

Encrypted Traffic Analytics focuses on identifying malware communications in encrypted traffic through passive monitoring, the extraction of relevant data elements and supervised machine learning with cloud-based global visibility.

## Benefits

- **Security visibility:** Gain insight into threats in encrypted traffic using network analytics. Obtain contextual threat intelligence with real-time analysis correlated with user and device information.
- **Cryptographic assessment:** Ensure enterprise compliance with cryptographic protocols and visibility into and knowledge of what is being encrypted and what is not being encrypted on your network.
- **Faster time to response:** Quickly contain infected devices and users
- **Time and cost savings:** Use the network as the foundation for the security posture, capitalizing on security investments in the network.







# Cisco Catalyst 9000 Series Switches

## Switching for an entirely new era of networking. The Network. Intuitive.

Your network needs to understand the world it is connecting. But some switches are not designed to handle the demand of security threats, evolving IoT and mobility integration.

Cisco® networks have moved data for 80 percent of the internet for the last three decades. And we don't just move data. We study it. We work continually to understand it. We apply knowledge when we design our switches.

The result: a network that constantly learns, constantly adapts, constantly protects and the new Cisco Catalyst® Series switches.

## Benefits

- **Build a digital-ready network** with switches designed for security, mobility IoT and the cloud
- **Centrally manage policy** for simpler control
- **Simplify operations** by automating IT tasks
- **Handle threats** before, during and after attacks with built-in end-to-end security
- **Gain extraordinary visibility** into wired and wireless networks

## Switching for a changing world

Our Catalyst 9000 switches constantly adapt to help you solve new challenges. Their integrated security helps you address ever-changing threats. They simplify management of your evolving mobility, Internet-of-Things (IoT), and cloud requirements. Introducing an entirely new era of networking. The Network. Intuitive.

### Catalyst 9300 Series



The Catalyst 9300 Series is our top fixed-access enterprise network switch series, stacked to 480 Gbps.

### Catalyst 9400 Series



Cisco's leading modular-access switches for enterprise, the Catalyst 9400 Series supports up to 9 Tbps.

### Catalyst 9500 Series



The Catalyst 9500 Series is the industry's first fixed-core 40-Gbps switch for the enterprise.

## Sophisticated automation

The Catalyst 9000 Series is designed to do more tasks in less time. With Cisco DNA and SD-Access, these switches can be part of a network that brings together and learns from information across the network to create a simpler, more fluid experience. By automating mundane day-to-day operations you can shift IT time and money to focus on creativity and design.

## Transformational magic

The Cisco Catalyst 9000 Series is based on the Cisco UADP ASIC, which continually evolves to anticipate customer needs with exponential results, driving new industries and fostering innovations that have yet to be envisioned.

## Expansive security and intelligence

Cisco DNA casts a wide-net. It gathers information from a constellation of data points, connecting more devices and device types, making correlations and applying insights. It sees invisible threats and automates security responses. And it constantly adapts and protects by learning about threats across the world to stay ahead of the threats you face.

## A family of powerhouse switches

- Support advanced security capabilities like Encrypted Traffic Analytics (ETA), AES256/MACSEC256 and Trustworthy Systems
- Deliver IoT convergence with industry-leading scale and hardware-ready capabilities like perpetual UPOE/PoE Audio Visual Bridging (AVB)/IEEE 1588 and service discovery
- Run the open Cisco IOS XE, a modern operating system that supports model-driven programmability, streaming; telemetry, and patching
- Use x86-based CPUs and pluggable local storage for third-party container-based app hosting
- Provide outstanding application visibility and control with NBAR2. or Next-Generation Network-Based Application Recognition

# Security, automation and programmability

The Cisco Catalyst 9000 also combines a new onboard x86-based CPU (which has container-based app hosting) with the open Cisco IOS® XE 16, a converged operating system. Together they deliver advanced programmability, stronger security, greater wireless access point densities, support for higher bandwidth uplinks and a more advanced operating system than either the competition or our current Cisco Catalyst product line offers.

The network edge is the first line of defense where policy is applied to determine who or what has access to your network and to sense suspicious activity—even for encrypted traffic. It takes only one data breach to affect your organization. With so much potential for infiltration, it's critical to have a trusted solution to identify and control what gets on the network.

With that in mind, Catalyst 9000 Series switches support Trustworthy Systems and advanced security capabilities that help enable segmentation and micro-segmentation.

Encrypted Traffic Analytics (ETA) help you detect malware and other threats on encrypted traffic.

When your network is ready, the Catalyst 9000 switches can leverage Cisco Software-Defined Access (SD-Access) and the DNA Center, giving you policy-based automation from edge to cloud.

These turn your wired and wireless networks into a single fabric by decoupling network functions from hardware. The time it takes to deploy, secure and adapt network services and user access is reduced from months to minutes. And you can easily customize the network for user groups as needed.

## Catalyst 9300 Series



The **Cisco Catalyst 9300** is our leading fixed enterprise switching access platform built for security, mobility, IoT and the cloud. It is the next generation of the industry's most widely deployed switching platform.

The 9300 Series is the industry's first platform optimized for 802.11ac Wave 2 with the support for 2.5-Gbps/multigigabit downlinks and for Cisco perpetual UPOE and PoE+. It provides support for connecting a high density of 802.11ac Wave 2 access points (48) in a single RU box.

The Cisco Catalyst 9300 has the most flexible uplink architecture, with support for 1 Gbps, multigigabit, 10 Gbps and 40 Gbps. The platform offers a choice of multigigabit, 2.5-Gbps, or 1-Gbps copper Ethernet switches with uplink bandwidth of 80 Gbps and a 480-Gbps stacking bandwidth solution.

## Catalyst 9400 Series



The **Cisco Catalyst 9400** is Cisco's leading modular enterprise switching access platform built for security, mobility, IoT and the cloud.

The platform gives you investment protection with a chassis architecture that is capable of supporting up to 9 Tbps of system bandwidth. It provides exceptional power delivery scale with the industry's highest density of UPOE ports. The Cisco Catalyst 9400 also delivers state-of-the-art high availability with capabilities like our In-Service Software Upgrade (ISSU), NSF/SSO, uplink resiliency, N+1/N+N redundancy for power supplies and perpetual Power over Ethernet (PoE). The platform is designed for the enterprise with an innovative dual serviceable fan-tray design and side-to-side airflow. It's even crammed-closet friendly with a depth of about 16 inches. A single system can scale up to 384 access ports with a choice of multigigabit, 1-Gbps copper SFP, 10-Gbps SFP+, Cisco UPOE and PoE+ options.

## Catalyst 9500 Series



The **Cisco Catalyst 9500** is our leading purpose-built fixed-core/aggregation enterprise switching platform built for security, mobility, IoT and the cloud. Cisco Catalyst 9500 Series switches are the industry's first purpose-built 40-Gbps switches targeted for the enterprise campus, delivering exceptional table scales and buffering for enterprise applications.

The platform offers non-blocking 40-Gbps Quad Small Form-Factor Pluggable (QSFP) and 10-Gbps (SFP+) switches with granular port densities that meet diverse campus needs. The Cisco Catalyst 9500 supports advanced routing and infrastructure services, SD-Access border capabilities and network system virtualization with StackWise® virtual technology, which are critical for its placement in the campus core.

The platform also supports all the foundational high-availability capabilities like patching, Graceful Insertion and Removal (GIR), Nonstop Forwarding with Stateful Switchover (NSF/SSO), redundant platinum-rated power supplies and fans.

## What's new

Our new Cisco Catalyst 9000 Series switches are the next generation in the legendary Cisco Catalyst family of enterprise LAN access, aggregation and core switches. They form the foundational building block for Cisco Digital Network Architecture (Cisco DNA™) and for an entirely new era of networking. The Network. Intuitive.

These are the first purpose-built platforms designed to take advantage of the DNA and Cisco Software-Defined Access (SD-Access). As a significant addition to the "DNA ready" portfolio, the Catalyst 9000 Series delivers high performance and functionality, plus exceptional power delivery scale with industry's highest density of Cisco Universal Power Over Ethernet (Cisco UPOE™) ports. These switches extend our networking leadership

with breakthrough innovations in security, mobility, the Internet of Things (IoT) and the cloud. The Catalyst 9000 Series is also the first in the line to offer more flexible licensing options. New subscription based software licenses mean you can purchase the features and capabilities you need.

Like its predecessor, Cisco Catalyst 9000 Series switches leverage the strengths of the Cisco Unified Access™ Data Plane (UADP) Application Specific Circuit (ASIC). With the new UADP 2.0, the Catalyst 9000 Series delivers twice the performance with comparable pricing while adding a host of new features and functionality.



# What's New

Enterprise networks today are required to be secure, reliable, and connectable seamlessly anywhere, anytime, for any user, and on any device. This catalog introduces the lineup of new products designed to deliver enterprise networks that help steer small- and medium-sized companies toward business success.

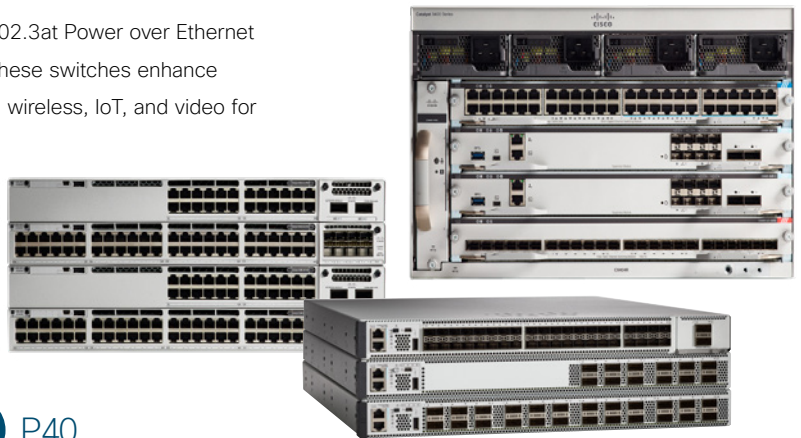
**i** Please contact your authorized Cisco partner, authorized Cisco distributor or Cisco reseller for details on the release date.

## Switches

### Revolutionary Catalyst 9000 Series

The **Cisco® Catalyst® 9000 switches** are the next generation of enterprise-class switches built for security, Internet of Things (IoT), mobility, and cloud. These switches form the foundational building block for Cisco Software-Defined Access (SD-Access), the company's lead enterprise architecture. The Cisco Catalyst 9000 switches are based on x86 CPU and Cisco Unified Access Data Plane (UADP) Version 2.0, which support full programmability and serviceability as well as convergence between wired and wireless over a single platform. The switches provide superior high availability and unmatched security features for the next-generation enterprise network designs. Wired and wireless security and application visibility are natively built into the switches.

The Cisco Catalyst 9000 switches also support full IEEE 802.3at Power over Ethernet Plus (PoE+), and Universal Power over Ethernet (UPoE). These switches enhance productivity by enabling applications such as IP telephony, wireless, IoT, and video for a true borderless network experience.



Cisco Catalyst 9000 Series  P40

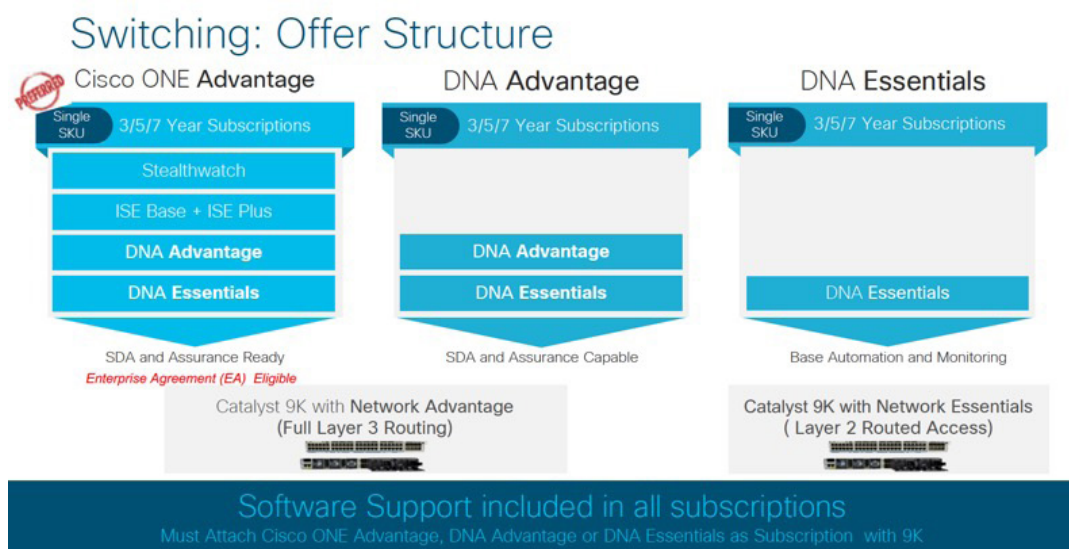
# Cisco DNA for Access Wireless and Switching Subscription

## Introducing New Software Subscription Licensing

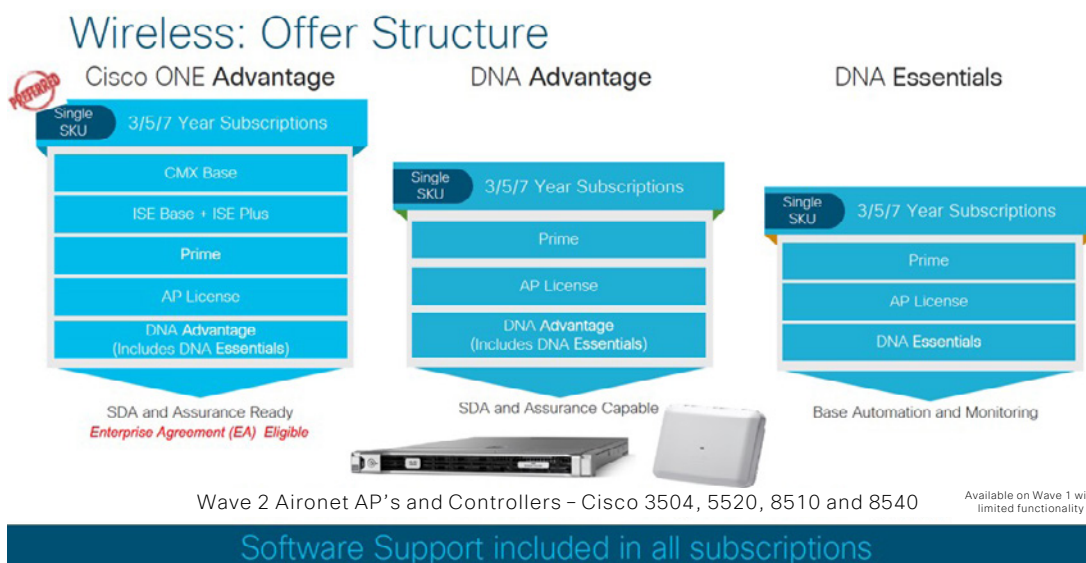
Cisco Digital Network Architecture services will be delivered through Cisco ONE™ Software, a simple, straightforward approach to consuming high-value solutions with license portability and purchase flexibility. Customers can start their Cisco Digital Network Architecture journey today on our current portfolio with the confidence of knowing that they can adopt network innovations in the future, when it suits their business needs. That's the power of software.

Customers experience these benefits:

- “Better together” pricing can provide lower initial costs and reduce Total Cost of Ownership (TCO) over the software lifecycle.
- Access to ongoing innovation gives the customer software upgrades and new features at no cost.
- Software license agility means licenses are portable between generations of hardware, eliminating the need to repurchase software when upgrading to new hardware.
- Software suites with 3-, 5-, or 7-year subscription license agreements provide simplicity.



Switching → P46



Wireless → P64

- Switches
- Wireless
- Routing
- Security
- Cisco Meraki
- DNA-Center
- SMB
- Software
- Financing
- Cisco Services
- Programs & Promotions

## Wireless

### Cisco® Aironet® 1540 Series outdoor access points

Cisco® Aironet® 1540 Series outdoor access points offer the latest 802.11ac Wave 2 functions in a rugged, ultra-low-profile housing that service providers and enterprises can deploy easily.

The Cisco Aironet 1540 Series is ideal for applications requiring rugged outdoor Wi-Fi coverage and supports the latest 802.11ac Wave 2 radio standard. Housed in a compact, aesthetically pleasing, easy-to-deploy package, the 1540 Series offers flexible deployment options for service providers and enterprise networks that need the fastest links possible for mobile outdoor clients (smartphones, tablets, and laptops) and wireless backhaul.

Cisco® Aironet® 1540 Series  P59



### Cisco 3504 Wireless Controller

Optimized for 802.11ac Wave 2 performance, the Cisco® 3504 Wireless Controller with Cisco Multigigabit Ethernet technology is a compact, highly scalable, service-rich, resilient, and flexible platform that enables next-generation wireless networks for small to medium-sized enterprises and branch office deployments.

Cisco 3504 Wireless Controller  P62



### 3802 AP with Virtual Beacons

A Module for the 3802 Access Point capable of providing Virtual Beacon Functionality without the need for standalone Beacon Points:

3802 AP with Virtual Beacons  P54



## Routers

### Cisco 1000 Series Integrated Services Routers

#### Reliability, security, and performance

Get Internet access, advanced security, and wireless services in one device. Cisco 1000 Series Integrated Services Routers (ISRs) are fixed, high-performance routers that are easy to deploy and manage. Small yet powerful, they provide highly secure broadband, Metro Ethernet, and wireless LAN connectivity.

Cisco ISR1000 series details  P68





# Cisco Meraki

## Cisco Meraki Z3

The **Cisco Meraki Z-Series teleworker gateway** is an enterprise class firewall, VPN gateway and router. Each model offers five gigabit ethernet ports and wireless for connectivity. Each model is designed to securely extend the power of Meraki cloud managed networking to employees, IT staff, and executives working from home.

The Z3 offers the latest in wireless performance with 802.11ac Wave 2 technology with MU-MIMO support to provide reliable and high speed network access for most demanding business applications and latest devices.



Cisco Meraki Z3  P87

## Virtual MX for Amazon Web Services & Microsoft Azure

Virtual MX is a virtual instance of a Meraki security appliance, dedicated specifically to providing the simple configuration benefits of site-to-site Auto VPN for customers running or migrating IT services to an **Amazon Web Services or Microsoft Azure Virtual Private Cloud (VPC)**. A virtual MX is added as an instance on EC2 or Azure and then configured in the Meraki dashboard, just like any other MX. It functions like a VPN concentrator.



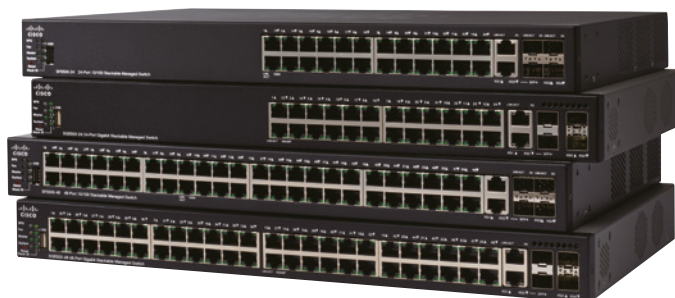
Virtual MX for Amazon Web Services & Microsoft Azure  P87

# Small Business

## New Models of Stackable 10 Gigabit Managed Switches

The **Cisco Small Business 350X Series Stackable Managed Switches** and the **Cisco Small Business 550X Series Stackable Managed Switches** are an ideal line of stackable managed switches for small business, that provides the rich capabilities you need to support a more demanding network environment, at a very affordable price. Now additional new models provide 24 or 48 ports of Gigabit Ethernet and Fast Ethernet connectivity with 10 Gigabit uplinks, and also support **60W PoE** on selected ports to power compact switches, high-power wireless access points, or connected lighting.

Cisco Small Business 350X Series Stackable Managed Switches  P94

















Switches
Wireless
Routing
Security
Cisco Meraki
DNA-Center
SMB
Software
Financing
Cisco Services
Programs & Promotions

## Switches

No SDA/SDA Switches



## Line-up of Cisco Catalyst Switches

	NO SDA	SDA
Core	 <p>Cisco Catalyst 4500-X Series</p>	 <p>Cisco Catalyst 6800 Series</p>  <p>Cisco Nexus 7700 Series</p>  <p>Cisco Catalyst 9500 Series</p>
Core / Access		 <p>Cisco Catalyst 3850 Series</p>  <p>Cisco Catalyst 4500E Series</p>  <p>Cisco Catalyst 9400 Series</p>
Access	 <p>Cisco Catalyst 2960-X/XR Series</p>  <p>Cisco Catalyst 2960-L Series Switches</p>  <p>Cisco Catalyst 2960-Plus Series</p>	 <p>Cisco Catalyst 3650 Series</p>  <p>Cisco Catalyst 9300 Series</p>
Compact	 <p>Cisco Catalyst 2960-CX Series</p>  <p>Cisco Catalyst 3560-CX Series*</p>	

\* Will be supported as Extended nodes in the future.

## Cisco Catalyst 2960-CX Series

L2 compact switches suitable for deployment in the access layer. These switches deliver basic network services even outside the wiring closet.

➔ See page 26.

## Cisco Catalyst 3560-CX Series

L3 compact switches suitable for deployment in the access layer. These switches deliver advanced network services even outside the wiring closet.

➔ See page 26.

## Cisco Catalyst 2960-Plus Series

L2 fixed-configuration switches suitable for deployment in the access layer. FE is supported on all downlink ports.

➔ See page 27.

## Cisco Catalyst 2960-L Series

L2 Fix Gigabit Ethernet switches that provide entry-level enterprise-class Layer 2 access for branch offices, conventional workspaces, and out-of-wiring closet applications

➔ See page 27.

## Cisco Catalyst 2960-X/XR Series

L2/L3 fixed-configuration switches suitable for deployment in the access layer. GE and stacking are supported on all downlink ports.

➔ See page 28.

## Cisco Catalyst 3650 Series

L2/L3 fixed-configuration switches suitable for deployment in the access layer or core layer. Provide a wireless controller function to server as an integrated platform for wired/wireless LAN networks.

➔ See page 28.

## Cisco Catalyst 3850 Series

Next-generation L2/L3 fixed-configuration switches suitable for deployment in the access layer or core layer. Provide a wireless controller function to server as an integrated platform for wired/wireless LAN networks.

➔ See page 31.

## Cisco Catalyst 4500E Series

L2/L3 modular switches suitable for deployment in the access layer or core layer. The superior cost performance of these switches ensure the protection of investment over long periods.

➔ See page 33.

## Cisco Catalyst 4500-X Series

L3 fixed-configuration switches suitable for deployment in the core layer. Deliver excellent expandability and performance in environments with space constraints.

➔ See page 35.

## Cisco Catalyst 6800 Series

L3 fixed-configuration/modular switches suitable for deployment in the core layer. Provide network services optimized for 1/10/40 Gigabit Ethernet.

➔ See page 36.

## Cisco Nexus 7700 Series

Core switches to deliver exceptional availability, outstanding scalability with high-density 10, 40, and 100 Gigabit Ethernet ports and the proven and comprehensive Cisco NX-OS Software switching feature set.

➔ See page 37.

## Cisco Catalyst Next Generation C9K Series

**Cisco Catalyst 9300:** lead next-generation stackable enterprise switching platform built for security, IoT, mobility, and cloud for deployment in the access layer and foundational building block for Software-Defined Access (SD-Access)

**Cisco Catalyst 9500:** lead next generation enterprise-class core and aggregation layer switches built for security, IoT, mobility, and cloud and foundational building block for Software-Defined Access (SD-Access)

**Cisco Catalyst 9400:** lead next generation modular enterprise switching platform built for security, IoT and cloud for deployment in the access or small core and foundational building block for Software-Defined Access (SD-Access)

➔ See page 40.

# How to Distinguish Specifications from SKU of Cisco Catalyst Switches

The SKU of each Cisco Catalyst Switch contains a broad description of the product's specification.

## Cisco Catalyst 2960-CX/2960-Plus/2960-X Series

**WS-C 2960 X-24 TS-L**

- Series Number** ← WS-C
- Model Type** ← 2960
  - CX : Compact model
  - + : FE model
  - X : GE model with stacking support <sup>\*1 \*2</sup>
  - XR : GE model with power supply redundancy and stacking support
- Number of Ports** ← 24
  - 8, 24, or 48
- Downlink Ports** ← X
  - T : Data-only port
  - L : Port with PoE power supply support (Full 15.4 W power on 8 ports)
  - P : Port with PoE power supply support (Full 15.4 W power on 24 ports) <sup>\*3</sup>
  - LP : Port with PoE power supply support (Full 15.4 W power on 24 ports)
  - FP : Port with PoE power supply support (Full 15.4 W power on 48 ports)
- Uplink Ports** ← TS
  - Q : GE port
  - T : GE port
  - C : GE/SFP port
  - S : SFP module slot
  - D : SFP/SFP+ module slot
- Cisco IOS** ← L
  - S or LL : LAN Lite
  - L : LAN Base
  - I : IP Lite

## Cisco Catalyst 3560-CX/3650/3850 Series

**WS-C 3850 -24 XU-S**

- Series Number** ← WS-C
- Number of Ports** ← 24
  - 8, 12, 24, or 48
- Downlink Ports** ← XU
  - T : Data-only port
  - P : Port with PoE power supply support (Full 15.4 W power on 24 ports) <sup>\*4</sup>
  - PF/F/PW : Port with PoE power supply support (Full 15.4 W power on 48 ports)
  - U : Port with UPOE power supply support
  - S : SFP module slot
  - X : mGig port or SFP/SFP+ module slot
- Cisco IOS** ← S
  - L : LAN Base
  - S : IP Base
  - E : IP Services

## Cisco Catalyst 4500E Series (Chassis)

**WS-C 4507 R+E**

- Number of Slots** ← 4507
  - 3, 6, 7, or 10
- Supervisor Engine Redundancy** ← R
  - None : Not supported
  - R : Supported

## Cisco Catalyst 4500E Series (Line Card)

**WS-X 4748 -RJ45 -E**

- Bandwidth per Slot** ← 47
  - 46 : 24 Gbps
  - 47 : 48 Gbps
- Port Interface** ← RJ45
  - RJ45 : GE port
  - RJ45V+ : GE port with PoE+ power supply support
  - U, UPOE : GE port with UPOE power supply support
  - X : mGig port
  - SFP : SFP module slot
  - X2 : X2 module slot
  - SFP+ : SFP/SFP+ module slot

## Cisco Catalyst 4500-X Series (no Network Module)

**WS-C 4500 X-F-16 SFP+**

- Cooling Fan** ← F
  - None : Front air intake/Rear exhaust
  - F : Rear air intake/Front exhaust
- Number of Ports** ← 16
  - 16 or 32

## Cisco Catalyst 4500-X Series (with Network Module)

**WS-C 4500 X-24 X-ES**

- Number of Ports** ← 24
  - 16 or 32
- Cisco IOS** ← ES
  - IPB : IP Base
  - ES : Enterprise Services

## Cisco Catalyst 9300

**C9300-24 UX-A**

- Series Number** ← C9300
- Number of Ports** ← 24
  - 24, 48
- Downlink Ports** ← UX
  - U : Port with UPOE power supply support
  - T : Data-only port
  - P : Port with PoE/PoE+ support
  - UX : Port mGig and UPOE
- Subscription Level** ← A
  - E=Essentials
  - A=Advantage

## Cisco Catalyst 9500

**C9500-24 Q-A**

- Series Number** ← C9500
- Number of Ports** ← 24
  - 12, 24, 40
- Downlink Ports** ← Q
  - Q : 40G ports
  - X : 10G ports (SFP+)
- Subscription Level** ← A
  - E=Essentials
  - A=Advantage

\*1 LAN Lite model does not support stacking. \*2 WS-C2960X-24PSQ-L is not supported. \*3 Compact switches support full 15.4 W power on 8 ports. \*4 Compact switches support full 15.4 W power on 8 or 12 ports.



## New Switch Selection Decision Tree

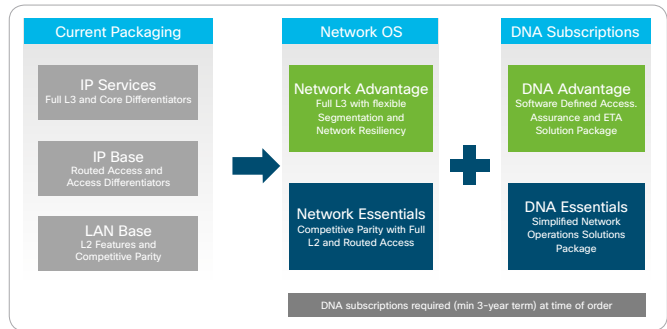


# Cisco IOS on Cisco Catalyst Switches

**Cisco IOS XE** opens a completely new paradigm in network configuration, operation, and monitoring through network automation. Cisco's automation solution is open, standards-based, and extensible across the entire lifecycle of a network device. The various automation mechanisms are outlined below.

**Automated device provisioning** is the ability to automate the process of upgrading software images and installing configuration files on Cisco Catalyst switches when they are being deployed in the network for the first time. Cisco provides both turnkey solutions such as Plug and Play and off-the-shelf tools such as Zero-Touch Provisioning (ZTP) and Preboot Execution Environment (PXE) that enable an effortless and automated deployment.

- **API-driven configuration** is available with modern network switches such as the Cisco Catalyst 9300 Series. It supports a wide range of automation features and provides robust open APIs over NETCONF using YANG data models for external tools, both off-the-shelf and custom built, to automatically provision network resources.
- **Granular visibility** enables model-driven telemetry to stream data from a switch to a destination. The data to be streamed is identified through subscription to a data set in a YANG model. The subscribed data set is streamed to the destination at specified intervals. Additionally, Open IOS-XE enables the push model. It provides near-real-time monitoring of the network, leading to quick detection and rectification of failures.



- **Seamless software upgrades and patching** supports OS resilience. Open IOS-XE supports patching, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support lets you add patches without having to wait for the next maintenance release.

## Packaging

The Cisco Catalyst 9000 family of switches introduces a new and simplified licensing package in the form of base and add-on licenses.

- **The base licensing** package includes the Network Essentials and Network Advantage licensing options that are tied to the hardware. Between them, the base licensing packages cover switching fundamentals, management automation, troubleshooting, and advanced switching features.
- **The add-on licensing** package includes the Cisco DNA Essentials and Cisco DNA Advantage options. In addition to on-box capabilities, the features available with this package provide Cisco innovations on the switch, as well as on Cisco DNA Center.

**License consumption** is easily determined by the package itself. While base licenses are always permanent and without an expiration date, add-on licenses have to be purchased for a 3-, 5-, or 7-year term (and hence are also known as term-based licenses). Table 7 shows the combinations of base and add-on licenses that must be purchased.

### ■ New Licencing support per platform

License Type	2960-L	CDB	2960-X	2960-P	2960-C	2960-CX	3560-XR	3560-CX	3750	3650, 3850 Copper	Cat 9300	4500 E (Sup 8E, Sup 9E)	4500 E (Sup 7E, Sup 7LE, SUP 8LE)	Cat 9400	3850 Fiber	4500 X	Cat 9500	Sup 2T (6500-E, 6807-XL)	Sup 6T (6500-E, 6807-XL), 6840, 6880
Network Essentials	-	-	-	-	-	-	-	-	-	-	●	-	-	●	-	-	-	-	-
DNA Essentials <sup>1</sup>	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network Advantage	●	-	-	-	-	-	-	-	-	-	●	-	-	●	-	-	●	-	-
DNA Advantage <sup>1</sup>	-	●	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

### ■ Licensing Combinations

	Cisco DNA Essentials	Cisco DNA Advantage
Network Essentials	Yes	No
Network Advantage	Yes*	Yes

\* For this combination, the Cisco DNA Essentials license must be ordered separately using Cisco Smart Software Manager.

### ■ Simplified Packaging for the New Era of Networking

What customer bought	Price-neutral C9300 license
IP Services	Advantage-7Y (Network Advantage + DNA Advantage for 7Y)
IP Base	Advantage-3Y (Network Advantage + DNA Advantage for 3Y)
LAN Base	Essentials-3Y (Network Advantage + DNA Advantage for 3Y)

## ■ Summary of Features included in the Essetails and Advantage packages:

The table shows the features included in the Essentials and Advantage packages.

### Essentials and Advantage Package Features

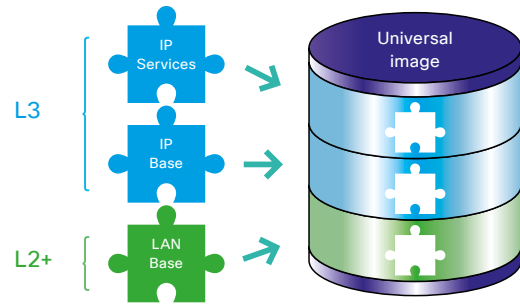
Features	Network Essentials	Network Advantage	Cisco DNA Essentials	Cisco DNA Advantage
<b>Switch features</b>				
<b>Switch features</b>				
Spanning Tree Protocol (STP), Rapid STP (RSTP), VLAN Trunking Protocol (VTP), trunking, Private VLAN (PVLAN), dynamic voice VLAN, IPv6, PnP, Cisco Discovery Protocol, 802.1Q tunneling (Q-in-Q), Routed Access - OSPF and RIP, Policy-Based Routing (PBR), Virtual Router Redundancy Protocol (VRRP), Internet Group Management Protocol (IGMP), PIM Stub, Weighted Random Early Detection (WRED), First Hop Security (FHS), 802.1X, MACsec-128, Control Plane Policing (CoPP), Cisco TrustSec® SGT Exchange Protocol (SXP), IP SLA Responder, SSO, EIGRP Stub, Microflow Policing, Class-Based Weighted Fair Queuing (CBWFQ), hierarchical QoS (H-QoS), Application Reporting, Syslog, SNMP	●	●	-	-
<b>Advanced switch capabilities and scale</b>				
BGP, EIGRP, Hot Standby Router Protocol (HSRP), IS-IS, Bootstrap Router (BSR), Multicast Source Discovery Protocol (MSDP), Bidirectional PIM (PIM-BIDIR), Label Switched Multicast (LSM), IP SLA, Full OSPF	-	●	-	-
<b>Switch features</b>				
Spanning Tree Protocol (STP), Rapid STP (RSTP), VLAN Trunking Protocol (VTP), trunking, Private VLAN (PVLAN), dynamic voice VLAN, IPv6, PnP, Cisco Discovery Protocol, 802.1Q tunneling	-	●	-	-
<b>Network segmentation</b>				
VPN Routing and Forwarding (VRF), Virtual Extensible LAN (VXLAN), Cisco Locator/ID Separation Protocol (LISP), Cisco TrustSec, SD-Wireless, Multiprotocol Label Switching (MPLS), Layer 3 VPN (L3VPN), Multicast VPN (mVPN)	-	●	-	-
<b>Optimized network deployments</b>				
mDNS gateway	-	-	-	●
<b>Automation</b>				
Netconf/YANG, PnP Agent, ZTP/Open PnP	●	●	-	-
<b>Advanced automation</b>				
Containers, Python, Cisco IOS Embedded Event Manager (EEM), Autonomic Networking Infrastructure	-	-	●	●
<b>Telemetry and visibility</b>				
Streaming telemetry, sampled NetFlow, Switched Port Analyzer (SPAN), Remote SPAN (RSPAN)	●	●	-	-
<b>Advanced telemetry and visibility</b>				
Flexible NetFlow, Wireshark	-	-	●	●
<b>Optimized telemetry a visibility</b>				
Encapsulated Remote SPAN (ERSPAN), Application Visibility and Control (AVC), NBAR2	-	-	-	●
<b>High availability and resiliency</b>				
NSF, Graceful Insertion and Removal (GIR)	-	●	-	-
<b>High availability and resiliency</b>				
Patching	-	-	-	●
<b>Security</b>				
MACsec-256	-	●	-	-
<b>Advanced security</b>				
Encrypted Traffic Analytics (ETA)	-	-	-	●
<b>Cisco DNA Center Features</b>				
<b>Day 0 network bring-up automation</b>				
Cisco Network Plug-n-Play application, network settings, device credentials	-	-	●	●
<b>Element management</b>				
Discovery, inventory, topology, software image, licensing, and configuration management	-	-	●	●
<b>Element management</b>				
Patching	-	-	-	●
<b>Network monitoring</b>				
Product Security Incident Response Team (PSIRT) compliance, end-of-life/end-of-sale reporting, telemetry quotient, client 360, device 360, top talkers/ NetFlow/streaming telemetry collection and correlation	-	-	●	●
<b>Static QoS configuration and monitoring</b>				
EasyQoS application	-	-	●	●
<b>Policy-based automation</b>				
SD-Access, group-based policy for access, app prioritization, monitoring, and path selection; SD-Access with Integrated Wireless	-	-	-	●
<b>Network assurance and analytics</b>				
Insights driven from analytics and machine learning for the network, clients and applications that cover onboarding, connectivity, and performance	-	-	-	●



Cisco Catalyst Switches incorporate the **Cisco IOS (Internetwork Operating System)**, which is a high-performance network infrastructure software. **LAN Lite** and **LAN Base** feature sets provide the L2 level features, and **IP Lite, IP Base, IP Services, Advanced IP Services, Enterprise Services, and Advanced Enterprise Services** feature sets provide the L3 level features, respectively.

Cisco IOS provided with the Cisco Catalyst 3560-CX/3650/3850/4500-X/4500E Series is delivered in a single universal image. The universal image contains the entire Cisco IOS feature set that can be activated via a software license. A software image needed to be installed in order to use the new functions on previous Cisco Catalyst Switches. However, on the Cisco Catalyst 3560-CX/3650/3850/4500-X/4500E Series Switches, advanced functions can be activated immediately using the Cisco IOS Upgrade License.

■ Activating Features via a License (For Catalyst 3650/3850 Series)



■ Series Compatibility Comparison (Cisco Catalyst 2960-CX/3560-CX/2960-Plus/2960-L/2960-X/3650/3850/4500-X/4500E Series)

Supported Series	LAN Lite (LL)	LAN Base (LB)	IP Lite (IPL)	IP Base (IPB)	IP Services (IPS)	Enterprise Services (ES)
Catalyst 2960-CX	-	●	-	-	-	-
Catalyst 3560-CX	-	-	-	●	●	-
Catalyst 2960-Plus	●	●	-	-	-	-
Catalyst 2960-L	●	-	-	-	-	-
Catalyst 2960-X	●	-	●	-	-	-
Catalyst 3650	-	●	-	●	●	-
Catalyst 3850	-	●	-	●	●	-
Catalyst 4500-X	-	-	-	●	-	●
Catalyst 4500E	-	●	-	●	-	●

■ Cisco IOS Specification Comparison (L2 Features)

Feature	LL	LB	IPL	IPB	IPS	ES
IEEE 802.1Q Trunking	●	●	●	●	●	●
DTP	●	●	●	●	●	●
UDLD	●	●	●	●	●	●
VTP	●	●	●	●	●	●
CDP	●	●	●	●	●	●
LLDP	●	●	●	●	●	●
LLDP-MED	-	●	●	●	●	●
STP (Spanning Tree Protocol)	●	●	●	●	●	●
Flex Link	-	●	●	●	●	●
EtherChannel	●	●	●	●	●	●
LACP	●	●	●	●	●	●
Link State Tracking	-	●	●	●	●	●
Resilient Ethernet Protocol (REP)	-	-	-	● <sup>*2</sup>	●	●
Per-Port Storm Control	●	●	●	●	●	●

■ Cisco IOS Specification Comparison (L3 Features)

Feature	LL	LB	IPL	IPB	IPS	ES
Static Routing	-	●	●	●	●	●
RIP	-	-	●	●	●	●
EIGRP Stub	-	-	●	●	●	●
EIGRP	-	-	-	-	●	●
OSPF for Routed Access	-	-	●	●	●	●
OSPF v2/v3	-	-	-	-	●	●
BGP	-	-	-	-	●	●
IS-IS	-	-	-	-	●	●
Policy Based Routing (PBR)	-	-	●	●	●	●
VRF-Lite	-	-	-	-	●	●
PIM Stun	-	-	●	●	●	●
PIM	-	-	-	-	●	●
WCCP	-	-	-	-	●	●
SSO	-	● <sup>*3</sup>	-	● <sup>*4</sup>	●	●
NSF	-	-	-	●	●	●

■ Cisco IOS Specification Comparison (Managability)

Feature	LL	LB	IPL	IPB	IPS	ES
SNMP	●	●	●	●	●	●
RMON	●	●	●	●	●	●
SPAN	●	●	●	●	●	●
RSPAN	-	●	●	●	●	●
TDR	●	●	●	●	●	●
Smart Ports	●	●	●	●	●	●
Smart Install (client)	●	●	●	●	●	●
Smart Install (director)	-	● <sup>*3</sup>	-	●	●	●
Cisco IOS IP SLA (responder)	-	●	●	●	●	●
Cisco IOS IP SLA (initiator)	-	-	-	●	●	●
Cisco IOS EEM	-	-	-	●	●	●
Wireshark	-	-	-	● <sup>*4</sup>	● <sup>*4</sup>	●
Netflow-Lite	-	●	●	●	●	-
Flexible Netflow	-	-	-	●	●	●
EnergyWise	●	●	●	●	●	●
GOLD (GOLD-Lite)	●	●	●	●	●	●
OBFL	●	●	●	●	●	●

■ Cisco IOS Specification Comparison (Security)

Feature	LL	LB	IPL	IPB	IPS	ES
SSH	●	●	●	●	●	●
SSL	●	●	●	●	●	●
SCP	●	●	●	●	●	●
HTTPS	●	●	●	●	●	●
TACACS+	●	●	●	●	●	●
RADIUS	●	●	●	●	●	●
Port Security	●	●	●	●	●	●
DHCP Snooping	-	●	●	●	●	●
Dynamic ARP Inspection (DAI)	-	●	●	●	●	●
IP Source Guard	-	●	●	●	●	●
MAC Authentication Bypass for Voice	●	●	●	●	●	●
Private VLAN Edge	●	●	●	●	●	●
Private VLAN	-	-	●	●	●	●
Layer 2 - 4 ACL	-	●	●	●	●	●
Router ACL	-	● <sup>*5</sup>	●	●	●	●
VLAN ACL	-	-	●	●	●	●
Time Range ACL	-	● <sup>*3</sup>	●	●	●	●
Web Authentication	-	●	●	●	●	●
TrustSec SXP	-	●	●	●	●	●
TrustSec SGT/SGACL	-	● <sup>*5</sup>	●	●	●	●
MACsec	-	-	-	●	●	●
NEAT	-	●	●	●	●	●

■ Cisco IOS Specification Comparison (QoS)

Feature	LL	LB	IPL	IPB	IPS	ES
SRR	●	●	●	●	●	●
Priority Queue	●	●	●	●	●	●
Auto QoS	-	●	●	●	●	●
DSCP	-	●	●	●	●	●
Weighted Tail Drop (WTD)	-	● <sup>*6</sup>	-	● <sup>*6</sup>	●	-
Dynamic Buffer Limiting (DBL)	-	● <sup>*7</sup>	-	● <sup>*7</sup>	-	● <sup>*7</sup>
Control Plane Policing (CoPP)	-	● <sup>*3</sup>	-	● <sup>*4</sup>	● <sup>*4</sup>	●
Per VLAN Policy	-	-	●	●	●	●

\*1 Cisco Catalyst 2960-XR Series only.\*2 Cisco Catalyst 3650/3850 Series are to be supported in future software release.\*3 Cisco Catalyst 2960-CX/2960-X Series are not supported.  
\*4 Cisco Catalyst 3560-CX Series are not supported. \*5 Cisco Catalyst 3650/3850 Series are not supported.\*6 Cisco Catalyst 3560/3850 Series only.\*7 Cisco Catalyst 4500E Series only.

## Cisco Catalyst 2960-CX Series

The compact switches are Layer 2 switches that are purpose built to enhance scalability and reduce costs through cable consolidation. Extend enterprise-class services to wherever you want, far from the wiring closet. They provide advanced networking features for security and management, equivalent to Cisco Catalyst 2960-X Series.

### ■ Highlights

- Stylish, compact, fan-less design and silent in operation.
- Deep-sleep mode: average 60 %, max 80 % on power saving.
- Operating temperature advantage: -5 °C to 45°C.
- Various mounting options: under a desk, on a shelf, on a wall, on a DIN rail or even in a rack using mounting brackets.
- IT simplicity: zero-touch deployments & maintenance, Plug-n-Play (PnP).
- Traffic visibility: support [Cisco NetFlow-Lite](#) up to Layer 4, supported both on all downlink and uplink ports.



### ■ Cisco Catalyst 2960-CX Series

SKU	Downlinks		Uplinks			Cisco IOS	Web Auth	MAC sec	Max VLANs	PoE Output Ports			AC Power	Magnet	Rack Mount
	GE	mGig	GE	SFP	SFP/SFP+					PoE 7.7 W	PoE 15.4 W	PoE+ 30 W			
WS-C2960CX-8TC-L	8	-	2	2	-	LAN Base	●	-	255	-	-	-	Internal	- <sup>*1</sup>	- <sup>*2</sup>
WS-C2960CX-8PC-L	8	-	2	2	-	LAN Base	●	-	255	8	8	4	Internal	- <sup>*1</sup>	- <sup>*2</sup>

\*1 Magnet and Mounting Tray (CMPCT-MGNT-TRAY=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.

\*2 Rack Mounting Brackets (RCKMNT-19-CMPCT=/RCKMNT-23-CMPCT=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.

## Cisco Catalyst 3560-CX Series

The compact switches are Layer 3 switches that are purpose built to enhance scalability and reduce costs through cable consolidation. Extend enterprise-class services to wherever you want, far from the wiring closet. They provide advanced networking features for security and management, equivalent to Cisco Catalyst 3650/3850 Series.

### ■ Highlights

- Stylish, compact, fan-less design and silent in operation.
- Deep-sleep mode: average 60 %, max 80 % on power saving, 3.8 Watt only for a 8 port switch in deep-sleep mode.
- Operating temperature advantage: -5 °C to 45°C.
- Various mounting options: under a desk, on a shelf, on a wall, on a DIN rail or even in a rack using mounting brackets.
- IT simplicity: zero-touch deployments & maintenance, Plug-n-Play (PnP).
- Traffic visibility: support [Cisco NetFlow-Lite](#) up to Layer 4, supported both on all downlink and uplink ports.
- PoE pass-through: industry's first UPOE powered switch that can pass through up to 146 W to power up the devices connected to the switch ([WS-C3560CX-8PT-S](#)).
- new DC-DC powering option for usage in trains, buses, etc.
- Horizontal Stacking: stacking using the 10G SFP+ or mGig Front Panel Ports for up to 8 switches



### ■ Cisco Catalyst 3560-CX Series

SKU	Downlinks		Uplinks			Cisco IOS	Web Auth	MAC sec	Max VLANs	PoE Output Ports			AC Power	Magnet	Rack Mount
	GE	mGig	GE	SFP	SFP/SFP+					PoE 7.7 W	PoE 15.4 W	PoE+ 30 W			
WS-C3560CX-8TC-S	8	-	2	2	-	IP Base	●	●	1023	-	-	-	Internal	- <sup>*2</sup>	- <sup>*3</sup>
WS-C3560CX-8PT-S	8	-	2	-	-	IP Base	●	●	1023	8	8	8	External <sup>*1</sup>	- <sup>*2</sup>	- <sup>*3</sup>
WS-C3560CX-8PC-S	8	-	2	2	-	IP Base	●	●	1023	8	8	8	Internal	- <sup>*2</sup>	- <sup>*3</sup>
WS-C3560CX-8XPD-S	6	2	-	-	2	IP Base	●	●	1023	8	8	8	Internal	- <sup>*2</sup>	- <sup>*3</sup>
WS-C3560CX-12TC-S	12	-	2	2	-	IP Base	●	●	1023	-	-	-	Internal	- <sup>*2</sup>	- <sup>*3</sup>
WS-C3560CX-12PC-S	12	-	2	2	-	IP Base	●	●	1023	12	12	8	Internal	- <sup>*2</sup>	- <sup>*3</sup>
WS-C3560CX-12PD-S	12	-	2	-	2	IP Base	●	●	1023	12	12	8	Internal	- <sup>*2</sup>	- <sup>*3</sup>

### ■ Cisco IOS Upgrade License for Cisco Catalyst 3560-CX Series

SKU	Description
L-C3560CX-RTU=	Cisco IOS IP Services license for Cisco Catalyst 3560-CX Series

\*1 Power Adapter and Power Cord is Required when not using PoE receiving. \*2 Magnet and Mounting Tray (CMPCT-MGNT-TRAY=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.  
\*3 Rack Mounting Brackets (RCKMNT-19-CMPCT=/RCKMNT-23-CMPCT=) is required. Optional new Power Adapter Bracket (PWR-ADPT-BRKT=) is available.

## Comparison of Cisco Catalyst Compact Switches

### ■ Comparison of Cisco Catalyst 2960-CG & 2960-CX Compact Switches

Parameter	Feature	2960-CG	2960-CX
Ports	Uplinks	2 x GE/SFP	2 x GE and 2 x SFP
	Downlinks	8 x GE	8 x GE
PoE	PoE	-	124 W PoE+
	Perpetual PoE	-	● <sup>*1</sup>
Hardware	DRAM, Flash	128 MB, 64 MB	512 MB, 128 MB
	Security	802.1x	802.1x, SXP <sup>*2</sup>
Other	AVC	-	NetFlow Lite

### ■ Comparison of Cisco Catalyst 3560-CG & 3560-CX Compact Switches

Parameter	Feature	3560-CG	3560-CX
Ports	Uplinks	2 x GE or 2 x SFP	2 x GE and SFP/SFP+ <sup>*3</sup>
	Downlinks	8 x GE	8 x GE or 12 x GE
PoE	mGig	-	● <sup>*4</sup>
	PoE	124 W PoE+	240 W PoE+
	PoE pass-through	1 x UPOE, 23.8 W	2 x UPOE, 144.8 W <sup>*1</sup>
	DC Power	-	● <sup>*1</sup>
	Power Stacking	-	Horizontal <sup>*1</sup>
Software	Cisco IOS	IP Base Only	IP Base, IP Services
	Hardware	DRAM, Flash	128 MB, 64 MB
	Security	802.1x, MACsec	802.1x, MACsec, SXP <sup>*1</sup> , SGACL <sup>*1</sup>
Other	AVC	NO	NetFlow Lite
	IPv6	Basic	Enhanced

\*1 On roadmap. \*2 SGACL is not supported. \*3 WS-C3560CX-8XPD-S & WS-C3560CX-12PD-S only. \*4 WS-C3560CX-8XPD-S only.

# Cisco Catalyst 2960 Series Transition Guide

## ■ Cisco Catalyst 2960-SF/2960-Plus Series<sup>\*1</sup>

Stacking Supported	Stacking Not Supported
Legacy Models	Current Models
WS-C2960S-F24TS-S <sup>*2</sup>	WS-C2960+24TC-S WS-C2960+24LC-S WS-C2960+24PC-S
WS-C2960S-F48TS-S <sup>*2</sup>	WS-C2960+48TC-S WS-C2960+48PST-S
WS-C2960S-F24TS-L	WS-C2960+24TC-L
WS-C2960S-F24PS-L	WS-C2960+24LC-L WS-C2960+24PC-L
WS-C2960S-F48TS-L	WS-C2960+48TC-L
WS-C2960S-F48LPS-L	WS-C2960+48PST-L
WS-C2960S-F48FPS-L	WS-C2960+48PST-L

## ■ Comparison of Main Features

	2960-Plus	2960-SF/2960-S	2960-X
Cisco IOS 15.0(2)SE and higher	●	●	●
Cisco IOS IP Lite	-	-	● <sup>*3</sup>
IPv6	●	●	●
Full PoE	●	●	●
PoE +	-	●	●
Duplexed power supply	-	-	●
FlexStack	-	●	●
FlexStack Plus	-	-	●

## Cisco FlexStack Plus module

When equipped with the optional **Cisco FlexStack Plus Module (C2960X-STACK)**, the **LAN Base/IP Lite** models of the **Cisco Catalyst 2960-X Series** support connection of up to eight switches in a stack at 80 Gbps.

## ■ Combined Stacks (Cisco FlexStack & Cisco FlexStack-Plus) Compatibility List

	2960-SF/S LAN Base	2960-X LAN Base	2960-XR IP Lite
2960-SF/S LAN Base	●	●	-
2960-X LAN Base	●	●	-
2960-XR IP Lite	-	-	●

## ■ Cisco Catalyst 2960-S/2960-X Series<sup>\*1</sup>

Stacking Supported	Current Models
Legacy Models	Current Models
WS-C2960S-24TS-S <sup>*2</sup>	WS-C2960X-24TS-LL <sup>*2</sup>
WS-C2960S-48TS-S <sup>*2</sup>	WS-C2960X-48TS-LL <sup>*2</sup>
WS-C2960S-24TS-L	WS-C2960X-24TS-L WS-C2960XR-24TS-I
WS-C2960S-24TD-L	WS-C2960X-24TD-L WS-C2960XR-24TD-I
WS-C2960S-24PS-L	WS-C2960X-24PSQ-L <sup>*2</sup> WS-C2960X-24PS-L WS-C2960XR-24PS-I
WS-C2960S-24PD-L	WS-C2960X-24PD-L WS-C2960XR-24PD-I
WS-C2960S-48TS-L	WS-C2960X-48TS-L WS-C2960XR-48TS-I
WS-C2960S-48TD-L	WS-C2960X-48TD-L WS-C2960XR-48TD-I
WS-C2960S-48LPS-L	WS-C2960X-48LPS-L WS-C2960XR-48LPS-I
WS-C2960S-48FPS-L	WS-C2960X-48FPS-L WS-C2960XR-48FPS-I
WS-C2960S-48LPD-L	WS-C2960X-48LPD-L WS-C2960XR-48LPD-I
WS-C2960S-48FPD-L	WS-C2960X-48FPD-L WS-C2960XR-48FPD-I

**Cisco FlexStack Plus** is backward-compatible with Cisco FlexStack. Up to four switches can be connected in a stack at 40 Gbps when (and only when) the LAN Base model of the Cisco Catalyst 2960-X Series is combined with the LAN Base model of the Cisco Catalyst 2960-SF/S Series.

## ■ Cisco FlexStack Plus Module

SKU	C2960X-STACK
Compatible IOS	LAN Base/IP Lite
Maximum Number of Devices	8
Stack Bandwidth	80 Gbps
Architecture	Hardware drop table
Dynamic Ring Load-balancing	-
Stack Convergence	100 milliseconds

\*1 Search for EOL10043 at cisco.com. \*2 Stacking is not supported. \*3 LAN Lite/LAN Base models are not supported.

# Cisco Catalyst 2960-L Series Switches



Cisco Catalyst® 2960-L Series Switches are entry-level, fixed-configuration, Gigabit Ethernet switches that provide enterprise-class Layer 2 access for branch offices, conventional workspaces, and out-of-wiring closet applications.

## ■ Highlights

- 6, 24, or 48 Gigabit Ethernet ports with line-rate forwarding.
- 2- or 4 Gigabit Small Form-Factor Pluggable (SFP) uplinks.
- Power over Ethernet Plus (PoE+) support with up to 370W of power budget.
- Fanless operation and operational temperature up to 55°C for deployment outside the wiring closet.

- Higher mean time between failure (MTBF), because they have no moving mechanical parts.
- Less than 11.5-inch depth fit in use cases with space limitation.
- Reduced power consumption and advanced energy management features.
- RJ45 and USB console access for simplified operations.
- Intuitive web user interface for easy deployment and management.
- Cisco IOS® Software features.
- Enhanced limited lifetime warranty offering next-business-day hardware replacement.

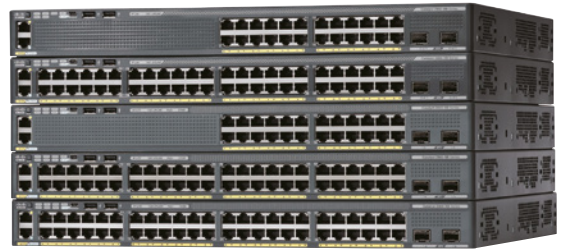
Product ID	10/100/1000 Ethernet Ports	Uplink Interfaces	Available PoE Power	Fanless	Dimensions (H x D x W)	Weight
WS-C2960L-8TS-LL	8	2 SFP	-	Y	1.73 x 8.45 x 10.56 in (4.4 x 21.5 x 26.8 cm)	3.33lb (1.51 kg)
WS-C2960L-8PS-LL	8	2 SFP	67W	Y	1.73 x 9.45 x 10.56 in (4.4 x 24 x 26.8 cm)	4.50lb (2.04 kg)
WS-C2960L-16TS-LL	16	2 SFP	-	Y	1.73 x 8.45 x 10.56 in (4.4 x 21.5 x 26.8 cm)	3.41lb (1.55 kg)
WS-C2960L-16PS-LL	16	2 SFP	120W	Y	1.73 x 9.45 x 10.56 in (4.4 x 24 x 26.8 cm)	4.65lb (2.11 kg)
WS-C2960L-24TS-LL	24	4 SFP	-	Y	1.73 x 9.45 x 17.5 in (4.4 x 24 x 44.5 cm)	6.04lb (2.74 kg)
WS-C2960L-24PS-LL	24	4 SFP	195W	Y	1.73 x 10.45 x 17.5 in (4.4 x 26.5 x 44.5 cm)	7.41lb (3.36 kg)
WS-C2960L-48TS-LL	48	4 SFP	-	Y	1.73 x 9.45 x 17.5 in (4.4 x 24 x 44.5 cm)	6.57lb (2.98 kg)
WS-C2960L-48PS-LL	48	4 SFP	370W	N	1.73 x 11.5 x 17.5 in (4.4 x 26.5 x 44.5 cm)	10.08lb (4.57 kg)
WS-C2960L-24TQ-LL	24	4 SFP+	-	Y	1.73 x 9.45 x 17.5 in (4.4 x 24 x 44.5 cm)	6.06lb (2.75kg)
WS-C2960L-24PQ-LL	24	4 SFP+	195W	Y	1.73 x 10.45 x 17.5 in (4.4 x 26.5 x 44.5 cm)	7.39lb (3.35kg)
WS-C2960L-48TQ-LL	48	4 SFP+	-	Y	1.73 x 9.45 x 17.5 in (4.4 x 24 x 44.5 cm)	6.68lb (3.03kg)
WS-C2960L-48PQ-LL	48	4 SFP+	370W	N	1.73 x 11.5 x 17.5 in (4.4 x 29.2 x 44.5 cm)	9.81lb (4.54kg)

## Cisco Catalyst 2960-X Series

Stackable L2/L3 fixed-configuration switches equipped Gigabit Ethernet downlink ports. A flexible and redundant power supply configuration is achieved via a stack function and mounting of multiple power supply modules or a redundant power supply system.

### ■ Highlights

- Equipped with Cisco IOS Universal Image (Supports **LAN Lite/LAN Base/IP Lite**)<sup>\*1</sup>
- Supports Layer 3 functions including HSRP and VRRP (**IP Lite** model)
- Equipped with PoE+ power supplying downlink ports (PSE model)
- Equipped with full PoE powering power supply (**WS-C2960X-48FPS-L/WS-C2960X-48FPD-L/WS-C2960XR-48FPS-I/WS-C2960XR-48FPD-I**)
- Supports multiple Power Supply Modules (**IP Lite** model)
- Supports **Cisco FlexStack Plus** (**LAN Base/IP Lite** models)



### ■ Cisco Catalyst 2960-X Series

SKU	Downlinks		Uplinks		Cisco IOS	Web Auth	Max VLANs	PoE Output Ports			Fanless	Power Supply	Power Redundancy	RPS	Flex Stack Plus	Rack Mount
	GE	GE	SFP	SFP/SFP+				PoE 7.7 W	PoE 15.4 W	PoE+ 30 W						
WS-C2960X-24TS-LL	24	-	2	-	LAN Lite	-	64	-	-	-	-	Fixed AC	-	-	-	1 RU
WS-C2960X-48TS-LL	48	-	2	-	LAN Lite	-	64	-	-	-	-	Fixed AC	-	-	-	1 RU
WS-C2960X-24TS-L	24	-	4	-	LAN Base	●	1024	-	-	-	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-24TD-L	24	-	-	2	LAN Base	●	1024	-	-	-	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-24PSQ-L	24	2	2	-	LAN Base	●	1024	8	6	3	●	Fixed AC	-	-	-	1 RU
WS-C2960X-24PS-L	24	-	4	-	LAN Base	●	1024	24	24	12	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-24PD-L	24	-	-	2	LAN Base	●	1024	24	24	12	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-48TS-L	48	-	4	-	LAN Base	●	1024	-	-	-	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-48TD-L	48	-	-	2	LAN Base	●	1024	-	-	-	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-48LPS-L	48	-	4	-	LAN Base	●	1024	48	24	12	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-48FPS-L	48	-	4	-	LAN Base	●	1024	48	48	24	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-48LPD-L	48	-	-	2	LAN Base	●	1024	48	24	12	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960X-48FPD-L	48	-	-	2	LAN Base	●	1024	48	48	24	-	Fixed AC	-	●	● <sup>*2</sup>	1 RU
WS-C2960XR-24TS-I	24	-	4	-	IP Lite	●	1024	-	-	-	-	250 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-24TD-I	24	-	-	2	IP Lite	●	1024	-	-	-	-	250 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-24PS-I	24	-	4	-	IP Lite	●	1024	24	24	12	-	640 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-24PD-I	24	-	-	2	IP Lite	●	1024	24	24	12	-	640 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-48TS-I	48	-	4	-	IP Lite	●	1024	-	-	-	-	250 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-48TD-I	48	-	-	2	IP Lite	●	1024	-	-	-	-	250 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-48LPS-I	48	-	4	-	IP Lite	●	1024	48	24	12	-	640 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-48FPS-I	48	-	4	-	IP Lite	●	1024	48	48	24	-	640 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-48LPD-I	48	-	-	2	IP Lite	●	1024	48	24	12	-	1025 W AC	●	-	● <sup>*2</sup>	1 RU
WS-C2960XR-48FPD-I	48	-	-	2	IP Lite	●	1024	48	48	24	-	1025 W AC	●	-	● <sup>*2</sup>	1 RU

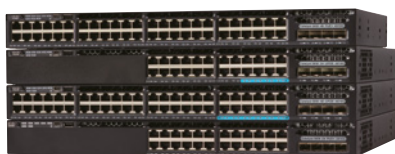
### ■ Power Supply Module for the Cisco Catalyst 2960-XR Series

SKU	Description	Compatible SKU
PWR-C2-250WAC	250 W AC power supply module	WS-C2960XR-24TS-I/WS-C2960XR-24TD-I/WS-C2960XR-48TS-I/WS-C2960XR-48TD-I
PWR-C2-640WAC	640 W AC power supply module	WS-C2960XR-24PS-I/WS-C2960XR-24PD-I/WS-C2960XR-48LPS-I/WS-C2960XR-48LPD-I
PWR-C2-1025WAC	1025 W AC power supply module	WS-C2960XR-48FPS-I/WS-C2960XR-48FPD-I

\*1 Upgrade is not supported. \*2 Cisco FlexStack Plus module (C2960X-STACK) is required.

## Cisco Catalyst 3650 Series

Stackable L2/L3 fixed-configuration switches that offer the wireless controller function. These switches incorporate a 160 Gbps stack function and support multiple Power Supply Modules to achieve a flexible redundant configuration. They also provide common intelligent services for both wired/wireless LAN networks, such as QoS and security.



### ■ Highlights

- Equipped with Cisco IOS XE Universal Image (Supports **LAN Base/IP Base/IP Services**)
- Equipped with the **Unified Access Data Plane (UADP)** ASIC
- Built-in controller function capable of managing up to 50 wireless access points (Supports **IP Base/IP Services**)
- Equipped with **Cisco Catalyst Multigigabit Technology (mGig)**-enabled downlink ports (some models)
- Equipped with PoE+/UPOE power supplying downlink ports (**UPOE** ports are only incorporated on some PSE models)
- Equipped with MACsec-enabled downlink./uplink ports (**IP Base/IP Services** models)
- Supports **Cisco StackWise-160**
- **Mini model** less than 12 inches deep (**WS-C3650-24PDM/WS-C3650-48FQM**)



■ Cisco Catalyst 3650 Series (1 of 2)

SKU	Wireless Throughput	Downlinks		Uplinks			Cisco IOS	MAC sec	Max VLANs	PoE Output Ports			Power Supply	Power Redundancy	RPS	Rack Mount
		GE	mGig	SFP	SFP/SFP+	QSFP+				PoE 15.4 W	PoE+ 30 W	UPOE 60 W				
WS-C3650-24TS-L	20 Gpbs	24	-	4	-	-	LAN Base	-*1	255	-	-	-	250 W AC	●	-	1 RU
WS-C3650-24TS-S	20 Gpbs	24	-	4	-	-	IP Base	●	4094	-	-	-	250 W AC	●	-	1 RU
WS-C3650-24TS-E	20 Gpbs	24	-	4	-	-	IP Services	●	4094	-	-	-	250 W AC	●	-	1 RU
WS-C3650-24TD-L	20 Gpbs	24	-	2	2	-	LAN Base	-*1	255	-	-	-	250 W AC	●	-	1 RU
WS-C3650-24TD-S	20 Gpbs	24	-	2	2	-	IP Base	●	4094	-	-	-	250 W AC	●	-	1 RU
WS-C3650-24TD-E	20 Gpbs	24	-	2	2	-	IP Services	●	4094	-	-	-	250 W AC	●	-	1 RU
WS-C3650-24PS-L	20 Gpbs	24	-	4	-	-	LAN Base	-*1	255	24	13	-	640 W AC	●	-	1 RU
WS-C3650-24PS-S	20 Gpbs	24	-	4	-	-	IP Base	●	4094	24	13	-	640 W AC	●	-	1 RU
WS-C3650-24PS-E	20 Gpbs	24	-	4	-	-	IP Services	●	4094	24	13	-	640 W AC	●	-	1 RU
WS-C3650-24PDM-L	20 Gpbs	24	-	2	2	-	LAN Base	-*1	255	24	13	-	640 W AC	-	●	1 RU
WS-C3650-24PDM-S	20 Gpbs	24	-	2	2	-	IP Base	●	4094	24	13	-	640 W AC	-	●	1 RU
WS-C3650-24PDM-E	20 Gpbs	24	-	2	2	-	IP Services	●	4094	24	13	-	640 W AC	-	●	1 RU
WS-C3650-24PD-L	20 Gpbs	24	-	2	2	-	LAN Base	-*1	255	24	13	-	640 W AC	●	-	1 RU
WS-C3650-24PD-S	20 Gpbs	24	-	2	2	-	IP Base	●	4094	24	13	-	640 W AC	●	-	1 RU
WS-C3650-24PD-E	20 Gpbs	24	-	2	2	-	IP Services	●	4094	24	13	-	640 W AC	●	-	1 RU
WS-C3650-8X24PD-L	<b>NEW</b> 20 Gpbs	24	8	-	2	-	LAN Base	-*1	255	24	14	-	750 W AC	●	-	1 RU
WS-C3650-8X24PD-S	<b>NEW</b> 20 Gpbs	24	8	-	2	-	IP Base	●	4094	24	14	-	750 W AC	●	-	1 RU
WS-C3650-8X24PD-E	<b>NEW</b> 20 Gpbs	24	8	-	2	-	IP Services	●	4094	24	14	-	750 W AC	●	-	1 RU
WS-C3650-8X24UQ-L	<b>NEW</b> 20 Gpbs	24	8	-	4	-	LAN Base	-*1	255	24	24	13	1100 W AC	●	-	1 RU
WS-C3650-8X24UQ-S	<b>NEW</b> 20 Gpbs	24	8	-	4	-	IP Base	●	4094	24	24	13	1100 W AC	●	-	1 RU
WS-C3650-8X24UQ-E	<b>NEW</b> 20 Gpbs	24	8	-	4	-	IP Services	●	4094	24	24	13	1100 W AC	●	-	1 RU

\*1 Cisco IOS IP Base/IP Services License is required.

## Cisco Catalyst 3000 Series Transition Guide

■ Cisco Catalyst 3560-X/3650 Series\*1

Legacy Models	Current Models
WS-C3560X-24T-L	WS-C3650-24TS-L WS-C3650-24TD-L
WS-C3560X-24P-L	WS-C3650-24PS-L WS-C3650-24PD-L WS-C3650-8X24PD-L
WS-C3560X-24U-L	WS-C3650-24PS-L WS-C3650-24PD-L WS-C3650-8X24PD-L
WS-C3560X-48T-L	WS-C3650-48TS-L WS-C3650-48TD-L WS-C3650-48TQ-L
WS-C3560X-48P-L	WS-C3650-48PS-L WS-C3650-48PD-L WS-C3650-48PQ-L WS-C3650-12X48FD-L
WS-C3560X-48PF-L	WS-C3650-48FS-L WS-C3650-48FD-L WS-C3650-48FQ-L WS-C3650-12X48FD-L WS-C3650-12X48UQL WS-C3650-12X48UR-L WS-C3650-12X48UZ-L
WS-C3560X-48U-L	WS-C3650-48FS-L WS-C3650-48FD-L WS-C3650-48FQ-L WS-C3650-12X48FD-L WS-C3650-12X48UQ-L WS-C3650-12X48UR-L WS-C3650-12X48UZ-L

■ Cisco Catalyst 3560X/3650 S/E Models

Legacy Models	Current Models
WS-C3560X-24T-S/E	WS-C9300-24T-E/A
WS-C3560X-24P-S/E	WS-C9300-24P-E/A
WS-C3560X-24U-S/E	WS-C9300-24U-E/A
WS-C3560X-48T-S/E	WS-C9300-48T-E/A
WS-C3560X-48P-S/E	WS-C9300-48P-E/A
WS-C3560X-48PF-S/E	WS-C9300-48U-E/A
WS-C3560X-48U-S/E	WS-C9300-48U-E/A

■ Cisco Catalyst 3750-X/3850 Series

Legacy Models	Current Models
WS-C3750X-24T-L/S/E	WS-C9300-24T-E/A
WS-C3750X-24P-L/S/E	WS-C9300-24P-E/A
WS-C3750X-24U-L/S/E	WS-C9300-24U-E/A
WS-C3750X-48T-L/S/E	WS-C9300-48T-E/A
WS-C3750X-48P-L/S/E	WS-C9300-48P-E/A
WS-C3750X-48PF-L/S/E	WS-C9300-48U-E/A
WS-C3750X-48U-L/S/E	WS-C9300-48U-E/A
WS-C3750X-12S-S/E	WS-C3850-12S-S/E
WS-C3750X-24S-S/E	WS-C3850-24S-S/E

■ Cisco Catalyst 3650 Series Licenses - A La Carte Part Numbers for Cisco DNA Advantage

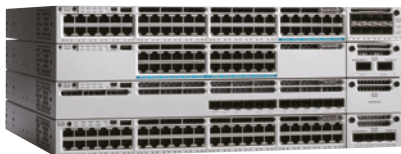
	Legacy Models	Suggested Models
24-port	C3650-DNA-A-24	C3650 DNA Advantage, 24-port term licenses
	C3650-DNA-A-24-3Y	C3650 DNA Advantage, 24-port, 3-year term license
	C3650-DNA-A-24-5Y	C3650 DNA Advantage, 24-port, 5-year term license
48-port	C3650-DNA-A-48	C3650 DNA Advantage, 48-port term licenses
	C3650-DNA-A-48-3Y	C3650 DNA Advantage, 48-port, 3-year term license
	C3650-DNA-A-48-5Y	C3650 DNA Advantage, 48-port, 5-year term license
Spare (for brownfield deployments only)	C3650-DNA-A-24=	C3650 DNA Advantage, 24-port term licenses spare
	C3650-DNA-A-48=	C3650 DNA Advantage, 48-port term licenses spare

\*1 Search for EOL10623 at cisco.com.



# Cisco Catalyst 3850 Series

Next-generation stackable L2/L3 fixed-configuration switches featuring a wireless controller function. These switches feature the industry's fastest 480 Gbps stack function, support for multiple Power Supply Modules and innovative power-sharing function to achieve a flexible and advanced redundant configuration. They also provide common intelligent services for both wired/wireless LAN networks, such as QoS and security.



## ■ Highlights

- Equipped with Cisco IOS XE Universal Image (Supports **LAN Base/IP Base/IP Services**)
- Equipped with the **Unified Access Data Plane (UADP)** ASIC
- Built-in controller function capable of managing up to 100 wireless access points (Supports **IP Base/IP Services**)
- Equipped with **Cisco Catalyst Multigigabit Technology (mGig)**-enabled downlink ports (some models)
- Equipped with PoE+/UPOE power supplying downlink ports (UPOE ports are only incorporated on some PSE models)
- Equipped with MACsec-enabled downlink ports (**IP Base/IP Services** models)
- MACsec-enabled uplink ports (Optional, **IP Base/IP Services** models)
- Supports **Cisco StackPower**<sup>1</sup>
- Supports **Cisco StackWise-480**<sup>1</sup>

## ■ Cisco Catalyst 3850 Series Licenses

The tables below list the product IDs for ordering Cisco DNA Advantage licenses for the Cisco Catalyst 3850 Series.

### ■ A La Carte Part Numbers for Cisco DNA Advantage for the Cisco Catalyst 3850 Series

	Product ID	Description
24-port	C3650-DNA-A-24	C3850 DNA Advantage, 24-port term licenses
	C3850-DNA-A-24-3Y	C3850 DNA Advantage, 24-port, 3-year term license
	C3850-DNA-A-24-5Y	C3850 DNA Advantage, 24-port, 5-year term license
48-port	C3850-DNA-A-48	C3850 DNA Advantage, 48-port term licenses
	C3850-DNA-A-48-3Y	C3850 DNA Advantage, 48-port, 3-year term license
	C3850-DNA-A-48-5Y	C3850 DNA Advantage, 48-port, 5-year term license
Spare (for brownfield deployments only)	C3850-DNA-A-24=	C3850 DNA Advantage, 24-port term licenses spare
	C3850-DNA-A-48=	C3850 DNA Advantage, 48-port term licenses spare

### ■ Cisco ONE Software Part Numbers for DNA Advantage for the Cisco Catalyst 3850 Series

	Product ID	Description
24-port	C1A1ATCAT38501	Cisco ONE Advantage term, C3850 24-port*
48-port	C1A1ATCAT38502	Cisco ONE Advantage term, C3850 48-port*

\*All midcycle refresh option PIDs are available under C1-CAT-ADD-T.

### ■ A La Carte Part Numbers for Cisco DNA Advantage for Cisco Catalyst 3850 Series (fiber)

License Type	Product ID	Description
12/24 port license (Advantage)	C3850XS-DNA-L-A	C3850 DNA Advantage, Low Port Term licenses
	C3850XS-DNA-L-A-3Y	C3850 DNA Advantage, Low Port, 3 Year Term license
	C3850XS-DNA-L-A-5Y	C3850 DNA Advantage, Low Port, 5 Year Term license
32-48 port license (Advantage)	C3850XS-DNA-A	C3850 DNA Advantage, High Port Term licenses
	C3850XS-DNA-A-3Y	C3850 DNA Advantage, High Port, 3 Year Term license
	C3850XS-DNA-A-5Y	C3850 DNA Advantage, High Port, 5 Year Term license
Spares (for brownfield deployments only)	C3850XS-DNA-L-A=	C3850 DNA Advantage, Low Port Term licenses, Spare
	C3850XS-DNA-A=	C3850 DNA Advantage, High Port Term licenses, Spare

### ■ Cisco ONE Software Part Numbers for DNA Advantage for Cisco Catalyst 3850 Series (Fiber)

License Type	Product ID	Description
12-port fiber	C1A1ATCAT38503	Cisco ONE Advantage term, C3850 12-port fiber*
24-port fiber	C1A1ATCAT38504	Cisco ONE Advantage term, C3850 24-port fiber*
	C1A1ATCAT38505	Cisco ONE Advantage term, C3850 48-port fiber*

\*All

The Base license for Cisco DNA Advantage is IP Base or IP Services. As such, only hardware PIDs with the "-S" or "-E" suffix must be chosen. Note that when the Base license is IP Base, you are limited to only 3 virtual networks. The Spare SKUs should be leveraged when buying Cisco DNA Advantage separately.

### ■ Network Module for the Cisco Catalyst 3850 Series

SKU	Description	Supported Configuration (SFP/SFP+/QSFP)
C3850-NM-4-1G	Network Module equipped with SFP module slots for 24/48-port models, mGig models, 1 G fiber models	4/0/0
C3850-NM-2-10G	Network Module equipped with SFP+ module slots for 24/48-port models, mGig models, 1 G fiber models	4/0/0-3/1/0-2/2/0-0/2/0
C3850-NM-4-10G	Network Module equipped with SFP+ module slots for 48-port models, mGig models, 10 G fiber models	4/0/0-3/1/0-2/2/0-1/3/0-0/4/0
C3850-NM-8-10G	Network Module equipped with SFP+ module slots for mGig models & 24-port 10 G fiber models	8/8/0
C3850-NM-2-40G	Network Module equipped with QSFP module slots for mGig models & 24-port 10 G fiber models	0/0/2

### ■ Power Supply Module for the Cisco Catalyst 3850 Series

SKU	Description	SKU	Description
PWR-C1-350WAC	350 W AC Power Supply Module	PWR-C3-750WAC-R	750 W AC Front-to-Back Airflow Power Supply Module for WS-C3850-48XS
PWR-C1-715WAC	715 W AC Power Supply Module	PWR-C3-750WAC-F	750 W AC Back-to-Front Airflow Power Supply Module for WS-C3850-48XS
PWR-C1-1100WAC	1100 W AC Power Supply Module	PWR-C3-750WDC-R	750 W DC Front-to-Back Airflow Power Supply Module for WS-C3850-48XS
PWR-C1-440WDC	440 W DC Power Supply Module	PWR-C3-750WDC-F	750 W DC Back-to-Front Airflow Power Supply Module for WS-C3850-48XS

Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

Cisco Services

Programs & Promotions

## Cisco Catalyst 3850 Series

SKU	Wireless Throughput	Downlinks			Uplinks <sup>2</sup>			Cisco IOS	MAC sec	Max VLANs	PoE Output Ports <sup>4</sup>			Power Supply	Rack Mount	
		GE	mGig	SFP	SFP / SFP +	SFP	SFP / SFP +				QSFP+	PoE 15.4 W	PoE + 30 W			UPOE 60 W
WS-C3850-24T-L	20 Gbps	24	-	-	-	4	2	-	LAN Base	- <sup>3</sup>	255	-	-	-	350 W AC	1 RU
WS-C3850-24T-S	20 Gbps	24	-	-	-	4	2	-	IP Base	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-24T-E	20 Gbps	24	-	-	-	4	2	-	IP Services	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-24P-L	20 Gbps	24	-	-	-	4	2	-	LAN Base	- <sup>3</sup>	255	24	14	-	715 W AC	1 RU
WS-C3850-24P-S	20 Gbps	24	-	-	-	4	2	-	IP Base	●	4094	24	14	-	715 W AC	1 RU
WS-C3850-24P-E	20 Gbps	24	-	-	-	4	2	-	IP Services	●	4094	24	14	-	715 W AC	1 RU
WS-C3850-24U-L	20 Gbps	24	-	-	-	4	2	-	LAN Base	- <sup>3</sup>	255	24	14	13	715 W AC	1 RU
WS-C3850-24U-S	20 Gbps	24	-	-	-	4	2	-	IP Base	●	4094	24	14	13	715 W AC	1 RU
WS-C3850-24U-E	20 Gbps	24	-	-	-	4	2	-	IP Services	●	4094	24	14	13	715 W AC	1 RU
WS-C3850-24XU-L	40 Gbps	-	24	-	-	4	8	2	LAN Base	- <sup>3</sup>	255	24	24	24	1100 W AC	1 RU
WS-C3850-24XU-S	40 Gbps	-	24	-	-	4	8	2	IP Base	●	4094	24	24	24	1100 W AC	1 RU
WS-C3850-24XU-E	40 Gbps	-	24	-	-	4	8	2	IP Services	●	4094	24	24	24	1100 W AC	1 RU
WS-C3850-48T-L	40 Gbps	48	-	-	-	4	4	-	LAN Base	- <sup>3</sup>	255	-	-	-	350 W AC	1 RU
WS-C3850-48T-S	40 Gbps	48	-	-	-	4	4	-	IP Base	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-48T-E	40 Gbps	48	-	-	-	4	4	-	IP Services	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-48P-L	40 Gbps	48	-	-	-	4	4	-	LAN Base	- <sup>3</sup>	255	28	14	-	715 W AC	1 RU
WS-C3850-48P-S	40 Gbps	48	-	-	-	4	4	-	IP Base	●	4094	28	14	-	715 W AC	1 RU
WS-C3850-48P-E	40 Gbps	48	-	-	-	4	4	-	IP Services	●	4094	28	14	-	715 W AC	1 RU
WS-C3850-48F-L	40 Gbps	48	-	-	-	4	4	-	LAN Base	- <sup>3</sup>	255	48	26	-	1100 W AC	1 RU
WS-C3850-48F-S	40 Gbps	48	-	-	-	4	4	-	IP Base	●	4094	48	26	-	1100 W AC	1 RU
WS-C3850-48F-E	40 Gbps	48	-	-	-	4	4	-	IP Services	●	4094	48	26	-	1100 W AC	1 RU
WS-C3850-48U-L	40 Gbps	48	-	-	-	4	4	-	LAN Base	- <sup>3</sup>	255	48	26	13	1100 W AC	1 RU
WS-C3850-48U-S	40 Gbps	48	-	-	-	4	4	-	IP Base	●	4094	48	26	13	1100 W AC	1 RU
WS-C3850-48U-E	40 Gbps	48	-	-	-	4	4	-	IP Services	●	4094	48	26	13	1100 W AC	1 RU
WS-C3850-12X48U-L	40 Gbps	36	12	-	-	4	8	2	LAN Base	- <sup>3</sup>	255	48	48	36	1100 W AC	1 RU
WS-C3850-12X48U-S	40 Gbps	36	12	-	-	4	8	2	IP Base	●	4094	48	48	36	1100 W AC	1 RU
WS-C3850-12X48U-E	40 Gbps	36	12	-	-	4	8	2	IP Services	●	4094	48	48	36	1100 W AC	1 RU
WS-C3850-12S-S	20 Gbps	-	-	12	-	4	2	-	IP Base	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-12S-E	20 Gbps	-	-	12	-	4	2	-	IP Services	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-12XS-S	40 Gbps	-	-	-	12	-	4	-	IP Base	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-12XS-E	40 Gbps	-	-	-	12	-	4	-	IP Services	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-24S-S	20 Gbps	-	-	24	-	4	2	-	IP Base	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-24S-E	20 Gbps	-	-	24	-	4	2	-	IP Services	●	4094	-	-	-	350 W AC	1 RU
WS-C3850-24XS-S	40 Gbps	-	-	-	24	-	8	2	IP Base	●	4094	-	-	-	715 W AC	1 RU
WS-C3850-24XS-E	40 Gbps	-	-	-	24	-	8	2	IP Services	●	4094	-	-	-	715 W AC	1 RU
WS-C3850-48XS-S	40 Gbps	-	-	-	48	-	-	4	IP Base	●	4094	-	-	-	750 W AC	1 RU
WS-C3850-48XS-E	40 Gbps	-	-	-	48	-	-	4	IP Services	●	4094	-	-	-	750 W AC	1 RU
WS-C3850-48XS-F-S	40 Gbps	-	-	-	48	-	-	4	IP Base	●	4094	-	-	-	750 W AC	1 RU
WS-C3850-48XS-F-E	40 Gbps	-	-	-	48	-	-	4	IP Services	●	4094	-	-	-	750 W AC	1 RU

## Additional Access Point License for the Cisco 3850 Series

SKU	Additional	Primary Upgrade SKU
L-LIC-CTIOS-1A	1	L-LIC-CT3850-UPG

## Cisco IOS XE Upgrade License for the Cisco Catalyst 3850 Series

SKU	Description
L-C3850-12-S-E	Cisco IOS IP Services License for 12-port IP Base model
L-C3850-24-L-S-E	Cisco IOS IP Base License for 24-port LAN Base model
L-C3850-24-S-E	Cisco IOS IP Services License for 24-port IP Base model
L-C3850-24-L-E	Cisco IOS IP Services License for 24-port LAN Base model
L-C3850-48-L-S	Cisco IOS IP Base License for 48-port LAN Base model
L-C3850-48-S-E	Cisco IOS IP Services License for 48-port IP Base model
L-C3850-48-L-E	Cisco IOS IP Services License for 48-port LAN Base model

## Cisco Catalyst 3850 Series Bundle

SKU	Bundle			
	Model	Network Module	Number of Access Point Licenses	Cisco IOS
WS-C3850-24PW-S	WS-C3850-24P-S	-	5	IP Base
WS-C3850-24UW-S	WS-C3850-24U-S	-	5	IP Base
WS-C3850-24XUW-S	WS-C3850-24XU-S	-	5	IP Base
WS-C3850-48W-S	WS-C3850-48P-S	-	5	IP Base
WS-C3850-48PW-S	WS-C3850-48F-S	-	5	IP Base
WS-C3850-48UW-S	WS-C3850-48U-S	-	5	IP Base
WS-C3850-12X48UW-S	WS-C3850-12X48U-S	-	5	IP Base
WS-C3850-16XS-S	WS-C3850-12XS-S	C3850-NM-4-10G	5	IP Base
WS-C3850-16XS-E	WS-C3850-12XS-E	C3850-NM-4-10G	5	IP Services
WS-C3850-32XS-S	WS-C3850-24XS-S	C3850-NM-8-10G	5	IP Base
WS-C3850-32XS-E	WS-C3850-24XS-E	C3850-NM-8-10G	5	IP Services



## Cisco Catalyst Multigigabit Technology (mGig)

### Challenges for Wired LAN Posed by 11ac "Gigabit Wireless LAN"

IEEE 802.11ac is a super high-speed wireless standard that delivers a theoretical maximum throughput of up to 6.9 Gbps. Wireless LAN is literally entering the "Gigabit era", but the migration to 11ac is presenting wired LAN with "old and new" challenges. In other words, these are the same old challenges that were experienced during the migration from 11a/g to 11n.

During the migration from 11a/g to 11n, it was obvious that Fast Ethernet switches (max 100 Mbps) had insufficient capacity to server as access switches for accommodating the access points. Similarly today, it is obvious that 1-Gigabit Ethernet switches (1 GE, max 1000 Mbps) have insufficient capacity when migrating from 11n to 11ac. Specifically:

- A bottleneck will occur if the uplink port of the access switches accommodating multiple 11ac compatible access points is 1 GE.
- A bottleneck will occur if the downlink port of the access switches accommodating 11ac Wave compatible access points is 1 GE.

Therefore, as was during the migration from 11a/g to 11n, replacement of access switches is therefore indispensable in order to unleash the full potential of 11ac. The only current IEEE standard that is faster than 1 GE is 10 Gigabit Ethernet (10 GE) with copper or optical fiber cables. However, there are some difficulties associated with the deployment of 10 GE-compatible switches.

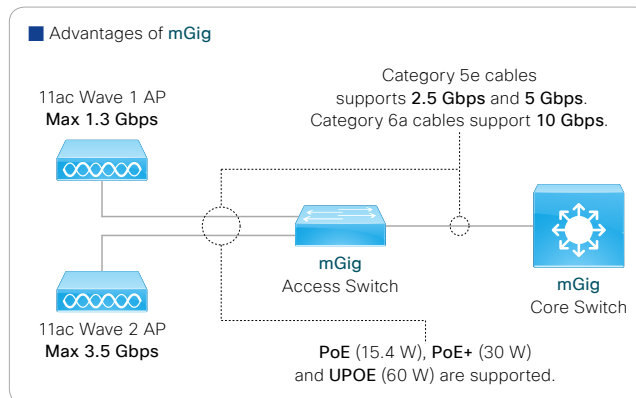
- Cable re-installation is required in many cases: Category 5e accounts for 46 % and Category 6 accounts for 28 % of the copper cables currently installed in corporations around the world, respectively. 10 GE via copper is not supported for Category 5e cables and is limited to a length of 55 meters for Category 6 cables. Installations of optical fiber cables and copper wire cables both require huge costs.
- Current 10 GE does not support PoE: Power supply units and power cables would be required for the access points.

### Cisco Catalyst Multigigabit Technology (mGig)

Cisco's innovative [Cisco Catalyst Multigigabit Technology \(mGig\)](#) has been developed to address all of these challenges posed by the deployment of 11ac. Largely, mGig offers the following three advantages:

- Multi-speed: Category 5e cables support 100 Mbps, 1 Gbps, 2.5 Gbps and 5 Gbps; and category 6a cables support 10 Gbps, respectively.
- Cable type: A wide variety of cable types are supported including Category 5e, Category 6, and Category 6a.
- PoE: PoE (15.4 W), PoE+ (30 W), and UPOE (60 W) are supported unlike the current 10 GE.

mGig is based on the technology of the NBASE-T Alliance established by Cisco in October 2014. A large number of vendors are participating in the NBASE-T Alliance; and IEEE standardization is currently being promoted for 2.5GBASE-T for 5GBASE-T.



### Cisco Catalyst Multigigabit Technology (mGig): Speeds and Cables

Cable Type	1 Gbps	2.5 Gbps	5 Gbps	10 Gbps
Cat 5e	●	●	●	-
Cat 6	●	●	●	● 55m
Cat 6a	●	●	●	●

## Cisco Catalyst 4500E Series

L2/L3 modular switches equipped with a 3/6/7/10-slot chassis. These switches can be configured with components that offer intergenerational upward and backward compatibility, including Chassis, Supervisor Engine and Line Card. Their outstanding cost performance will ensure the protection of investment over long periods.



### Highlights

- Broad range of interface options for 10/100/1000 and mGig on copper and 1 G/10 G on Fiber
- Equipped with Cisco IOS XE Universal Image (Supports **LAN Base/IP Base/Enterprise Services**)
- Equipped with the **Unified Access Data Plane (UADP) ASIC (WS-X45-SUP8-E)**
- Built-in controller function capable of managing up to 100 wireless access points (Supports **IP Base/Enterprise Services** on **WS-X45-SUP8-E**)
- Supports **Cisco VSS** (Switching capacity of up to 1.6 Tbps)
- Supports **Cisco TrustSec** (MACsec/SGT/SGACL)
- Switching capacity of up to 928 Gbps (**WS-X45-SUP8-E**)
- Bandwidth of up to 48 Gbps per slot
- IPv4 throughput of up to 250 Mpps (**WS-X45-SUP7-E/WS-X45-SUP8-E**)
- IPv6 throughput of up to 125 Mpps (**WS-X45-SUP7-E/WS-X45-SUP8-E**)
- Equipped with **Cisco Catalyst Multigigabit Technology (mGig)**-enabled downlink ports (**WS-X4748-12X48U+E**)

### A La Carte Part Numbers for Cisco DNA Advantage for the Cisco Catalyst 4500-E Series

Type	Product ID	Description
Advantage	C4500E-DNA-A	C4500E DNA Advantage term license
	C4500E-DNA-A-3Y	C4500E DNA Advantage 3-year term license
	C4500E-DNA-A-5Y	C4500E DNA Advantage 5-year term license
	C4500E-DNA-A-7Y	C4500E DNA Advantage 7-year term license
Spare (for brownfield deployments only)	C4500E-DNA-A=	C4500E DNA Advantage 3-year term license spare

### ■ Cisco ONE Software Part Numbers for DNA Advantage for Cisco Catalyst 4500-E Series

License Type	Product ID	Description
	C1A1ATCAT4500S	Cisco ONE Advantage Term C4500E*
16/24-port	C1A1ATCAT4500X	Cisco ONE Advantage Term 16/24 Port C4500X*
32-port	C1A2ATCAT4500X	Cisco ONE Advantage Term 32 Port C4500X*

\*All midcycle refresh option PIDs are available under C1-CAT-ADD-T.

The Base license for Cisco DNA Advantage is IP Base or Enterprise Services. As such, only hardware PIDs with the "-IPB" or "-ES" suffix must be chosen. Note that when the Base license is IP Base, you are limited to only 3 virtual networks.

### ■ Chassis for the Cisco Catalyst 4500E Series

SKU	Slots		Supervisor Engine Redundancy	Maximum Ports (equipped with Line Card)			Maximum PoE Power Supply (per slot)	Slots for Power Supply Module	Rack Mount
	Supervisor Engine	Line Card		GE	SFP	SFP+			
WS-C4503-E	1	2	-	96	96	24	1500 W	2	7 RU
WS-C4506-E	1	5	-	240	240	60	1500 W	2	10 RU
WS-C4507R+E	2	5	●	240	240	60	1500 W	2	11 RU
WS-C4510R+E	2	8	●	384	384	96	1500 W <sup>1</sup>	2	14 RU

### ■ Supervisor Engine for the Cisco Catalyst 4500E Series

SKU	Switching Capacity	Throughput		SFP/SFP+	Cisco IOS	Registered L3 Routes		Compatible Chassis			
		IPv4	IPv6			IPv4	IPv6	WS-C4503-E	WS-C4506-E	WS-C4507R+E	WS-C4510R+E
WS-X45-SUP7L-E	520 Gbps	225 Mpps	110 Mpps	2	IP Base	64K	32K	●	●	●	-
WS-X45-SUP7-E	848 Gbps	250 Mpps	125 Mpps	4	IP Base	256K	128K	●	●	●	●
WS-X45-SUP8L-E	560 Gbps	225 Mpps	110 Mpps	4	IP Base	64K	32K	●	●	●	-
WS-X45-SUP8-E	928 Gbps	250 Mpps	125 Mpps	8	IP Base	256K	128K	●	●	●	●
WS-X45-Sup9-E	928 Gbps	250 Mpps	125 Mpps	4x10G/2x40G	IP Base	256K	128K	●	●	●	●

### ■ Line Card for the Cisco Catalyst 4500E Series

SKU	Per-slot Bandwidth	Ports				PoE Output Ports		MAC sec	Power-saving (EEE)
		GE	SFP	SFP/SFP+	mGig	PoE+	UPOE		
WS-X4648-RJ45-E	24 Gbps	48	-	-	-	-	-	-	-
WS-X4648-RJ45V+E	24 Gbps	48	-	-	-	48	-	-	-
WS-X4612-SFP-E	24 Gbps	-	12	-	-	-	-	-	-
WS-X4624-SFP-E	24 Gbps	-	24	-	-	-	-	-	-
WS-X4748-RJ45-E	48 Gbps	48	-	-	-	-	-	●	●
WS-X4748-RJ45V+E	48 Gbps	48	-	-	-	48	-	●	●
WS-X4748-UPOE+E	48 Gbps	48	-	-	-	48	48 <sup>2</sup>	●	●
WS-X4748-12X48U+E	48 Gbps	36	-	-	12	48	48 <sup>2</sup>	●	●
WS-X4712-SFP-E	48 Gbps	-	12	-	-	-	-	●	-
WS-X4724-SFP-E	48 Gbps	-	24	-	-	-	-	●	-
WS-X4748-SFP-E	48 Gbps	-	48	-	-	-	-	●	-
WS-X4712-SFP+E	48 Gbps	-	-	12	-	-	-	●	-

### ■ Power Supply Module for the Cisco Catalyst 4500E Series

SKU	Type	Connectors	Maximum Output Power (Redundancy Mode)		Maximum PoE Devices (Redundancy Mode)		
			Data	PoE	PoE+ 15.4 W	PoE+ 30 W	UPOE 60 W
PWR-C45-1000AC	AC	1	1000 W + 40 W	-	-	-	-
PWR-C45-1300ACV	AC	1	1000 W + 40 W	800 W	48	24	12
PWR-C45-1400AC	AC	1	1360 W + 40 W	-	-	-	-
PWR-C45-2800ACV	AC	1	1360 W + 40 W	1400 W	84	43	21
PWR-C45-4200ACV	AC	2	1360 W + 40 W	1850 W (110 V) / 3700 W (220 V)	223	114	57
PWR-C45-6000ACV	AC	2	2200 W + 40 W	1850 W (110 V) / 4800 W (220 V)	289	148	74
PWR-C45-9000ACV	AC	3	1960 W + 40 W	2500 W (110 V) / 7500 W (220 V)	384	232	116

### ■ Cisco IOS XE Upgrade License for the Cisco Catalyst 4500E Series

SKU	Description
L-C4500E-LB-IP	Bundled IP Base License
L-C4500E-IP-ES	Cisco IOS Enterprise Services License for Supervisor Engine
L-C4500E-LB-ES	Bundled Cisco IOS Enterprise Services License

### ■ Cisco Catalyst 4500E Series Bundle

SKU	Bundle				Upgrade Options			
	Chassis	Supervisor Engine	Line Card	Cisco IOS	WS-X4748-UPOE+E	WS-X45-SUP8-E WS-X4748-RJ45V+E	WS-X45-SUP8-E WS-X4748-UPOE+E	WS-X45-SUP8-E WS-X4748-12X48U+E
WS-C4503E-S7L+48V+	WS-C4503-E	WS-X45-SUP7L-E	WS-X4648-RJ45V+E	LAN Base	C4500E-S3-UPOE	-	C4500E-3NR-8E-UPOE	C4500E-3NR-8E-MGIG
WS-C4506E-S7L+96	WS-C4506-E	WS-X45-SUP7L-E	WS-X4648-RJ45-E x 2	LAN Base	-	-	-	-
WS-C4506E-S7L+96V+	WS-C4506-E	WS-X45-SUP7L-E	WS-X4648-RJ45V+E x 2	LAN Base	C4500E-S6-UPOE	-	C4500E-6NR-8E-UPOE	C4500E-6NR-8E-MGIG
WS-C4507RE-S7L+96	WS-C4507R+E	WS-X45-SUP7L-E	WS-X4648-RJ45-E x 2	LAN Base	-	-	-	-
WS-C4507RE+96V+	WS-C4507R+E	WS-X45-SUP7L-E	WS-X4648-RJ45V+E x 2	LAN Base	C4500E-S7-UPOE	C4500E-S7L-S8	C4500E-7R-S8E-UPOE	C4500E-7R-S8E-MGIG
WS-C4510RE-S7+96V+	WS-C4510R+E	WS-X45-SUP7-E	WS-X4748-RJ45V+E x 2	LAN Base	C4500E-S7-UPOE	-	-	-
WS-C4510RE-S8+96V+	WS-C4510R+E	WS-X45-SUP8-E	WS-X4748-RJ45V+E x 2	LAN Base	C4510RE-S8-UPOE	-	-	C4510RE-S8-MGIG

\*1 Slots 3, 4, 7-10 are 750 W. \*2 Depends on modes of operation (Redundant 1 + 1 Mode, Redundant N + 1 Mode, Combined Mode).

# Cisco Catalyst 4500-X Series

L3 fixed-configuration switches equipped with SFP+ module slots. These switches deliver best-in-class scalability, simplified network virtualization, and integrated network services for space-constrained environments in campus networks. These switches can be expanded to accommodate SFP+ module slots using optional Network Modules.

## ■ Highlights

- Equipped with Cisco IOS XE Universal Image (Supports **IP Base/Enterprise Services**)
- Support for SDN/OpenFlow 1.3
- Supports **Cisco VSS** (Switching capacity of up to 1.6 Tbps)
- **Cisco TrustSec**-enabled hardware (MACsec/SGT/SGACL)
- Switching capacity of up to 800 Gbps
- IPv4 throughput of up to 250 Mpps
- IPv6 throughput of up to 125 Mpps
- Network module equipped with 8 SFP+ ports (Optional)

## ■ Cisco Catalyst 4500-X Series

SKU	SFP/SFP+		Cisco IOS	Registered L3 Routes		Multicast Routes		Cooling Fan	Power Supply Module Slots	Rack Mount
	Default	Maximum		IPv4	IPv6	IPv4	IPv6			
WS-C4500X-16SFP+	16	24*1	IP Base	64K	32K	24K	12K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-F-16SFP+	16	24*1	IP Base	64K	32K	24K	12K	Rear air intake/Front exhaust	2	1 RU
WS-C4500X-32SFP+	32	40*1	IP Base	256K	128K	32K	32K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-F-32SFP+	32	40*1	IP Base	256K	128K	32K	32K	Rear air intake/Front exhaust	2	1 RU
WS-C4500X-24X-IPB	24	24	IP Base	64K	32K	24K	12K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-24X-ES	24	24	Enterprise Services	64K	32K	24K	12K	Front air intake/Rear exhaust	2	1 RU
WS-C4500X-40X-ES	40	40	Enterprise Services	256K	128K	32K	32K	Front air intake/Rear exhaust	2	1 RU

## ■ Network Module for the Cisco Catalyst 4500-X Series

SKU	Description	Number of SFP/SFP+ Ports
C4KX-NM-8SFP+	Network Module equipped with SFP+ module slots	8

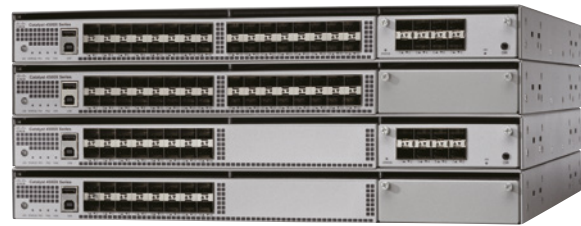
## ■ Power Supply Module for the Cisco Catalyst 4500-X Series

SKU	Description	Compatible SKU
C4KX-PWR-750AC-R	750 W AC Front-to-Back Cooling Power Supply Module	WS-C4500X-16SFP+/WS-C4500X-32SFP+/WS-C4500X-24X-IPB/WS-C4500X-24X-ES/WS-C4500X-40X-ES
C4KX-PWR-750AC-F	750 W AC Back-to-Front Cooling Power Supply Module	WS-C4500X-F-16SFP+/WS-C4500X-F-32SFP+
C4KX-PWR-750DC-R	750 W DC Front-to-Back Cooling Power Supply Module	WS-C4500X-16SFP+/WS-C4500X-32SFP+/WS-C4500X-24X-IPB/WS-C4500X-24X-ES/WS-C4500X-40X-ES
C4KX-PWR-750DC-F	750 W DC Back-to-Front Cooling Power Supply Module	WS-C4500X-F-16SFP+/WS-C4500X-F-32SFP+

## ■ Cisco IOS XE Upgrade License for the Cisco Catalyst 4500-X Series

SKU	Description	Compatible SKU
L-C4500X-16P-IP-ES	Cisco IOS Enterprise Services License for 16/24-port IP Base model	WS-C4500X-16SFP+/WS-C4500X-F-16SFP+/WS-C4500X-24X-IPB
L-C4500X-IP-ES	Cisco IOS Enterprise Services License for 24-port IP Base model	WS-C4500X-32SFP+/WS-C4500X-F-32SFP+

\*1 Network Module for the Cisco Catalyst 4500-X Series is required.



Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

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Programs & Promotions

# Cisco Virtual Switching System (VSS)

**Cisco Virtual Switching System (VSS)** is a cluster technology for operating two Cisco Catalyst Switches as one virtual logical switch. Both the Data Plane and Switch Fabric functionalities of the switches comprising a cluster will operate at 100% performance. It is therefore possible to configure a single logical switch capable of delivering 200% better performance than native Cisco Catalyst Switches. This technology also offers the following benefits in addition to performance improvement:

- Simple topology (No-loop network with no need for STP)

Since two physical switches are operated as one logical switch, there is no need for a redundancy protocol such as STP between the physical switches.

- Single routing instance

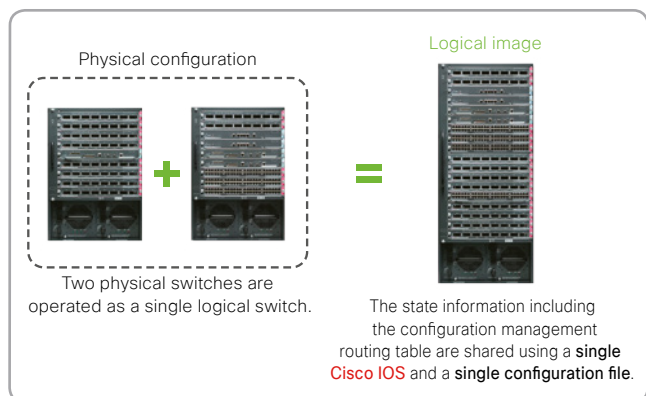
The second physical switch will continue to operate in the event when one of the physical switches fails. There will be no service interruption due to switching of networks and/or reconstruction of routing tables.

- Network manageability

The workload of the network administrator will be reduced as he/she only needs

to configure and manage one logical switch instead of two physical switches.

**Cisco Virtual Switching System (VSS)** is supported on the **Cisco Catalyst 4500-X/4500E/6500/6800 Series**.



# Cisco Catalyst 6800 Series

L3 switches optimized for 10/40/100 Gigabit Ethernet. The product lineup includes the fixed-configuration **Cisco Catalyst 6840-X/6880-X Series**, the modular **Cisco Catalyst 6807-XL**.



## ■ Highlights

- Equipped with Cisco IOS (Supports **IP Base/IP Services/Advanced IP Services/Advanced Enterprise Services**)<sup>†1</sup>
- Supports **Cisco VSS (C6807-XL)** has a switching capacity of up to 22.8 Tbps
- Supports **Cisco TrustSec (MACsec/SGT/SGACL)**
- Switching capacity of up to 11.4 Tbps (**C6807-XL**)
- Bandwidth of up to 880 Gbps per slot (**C6807-XL**)
- IPv4 throughput of up to 300 Mpps (**C6880-X**)
- IPv6 throughput of up to 150 Mpps (**C6880-X**)
- Equipped with 2 Native uplink ports of 40 G QSFP (**C6824-X-LE-40G/C6840-X-LE-40G**)

## ■ A La Carte Part Numbers for DNA Advantage for the Cisco Catalyst 6000 Series

License type	Term	Product ID
Advantage (low density)	Term	C6840-DNA-L-A
	3 years	C6840-DNA-L-A-3Y
	5 years	C6840-DNA-L-A-5Y
	7 years	C6840-DNA-L-A-7Y
Advantage (high density)	Term	C6807-DNA-A
	3 years	C6807-DNA-A-3Y
	5 years	C6807-DNA-A-5Y
	7 years	C6807-DNA-A-7Y
	Term	C6880-DNA-A
	3 years	C6880-DNA-A-3Y
	5 years	C6880-DNA-A-5Y
	7 years	C6880-DNA-A-7Y
	Term	C6840-DNA-A
	3 years	C6840-DNA-A-3Y
5 years	C6840-DNA-A-5Y	
7 years	C6840-DNA-A-7Y	
Spare	Term	C6840-DNA-L-A=
	Term	C6807-DNA-A=
	Term	C6880-DNA-A=
	Term	C6840-DNA-A=

The Base license for Cisco DNA Advantage is IP Base or Enterprise Services. As such, only hardware PIDs with the "-IPB" or "-ES" suffix must be chosen. Note that when the Base license is IP Base, you are limited to only 3 virtual networks.

## ■ Chassis for the Cisco Catalyst 6840-X Series

SKU	Switching Capacity	Ports		Maximum Ports		Cisco IOS	Registered L3 Routes		Registered NetFlow	Slots for Power Supply Module	Rack Mount
		SFP/SFP+	QSFP	SFP/SFP+	QSFP		IPv4	IPv6			
C6816-X-LE	80 Gbps	16	-	16	4 <sup>3</sup>	IP Services	256K	128K	512K	2	2 RU
C6832-X-LE	160 Gbps	32	-	32	8 <sup>3</sup>	IP Services	256K	128K	1024K	2	2 RU
C6824-X-LE-40G	160 Gbps	24	2	24 + 8 <sup>2</sup>	2 + 6 <sup>3</sup>	IP Services	256K	128K	1024K	2	2 RU
C6840-X-LE-40G	240 Gbps	40	2	40 + 8 <sup>2</sup>	2 + 10 <sup>3</sup>	IP Services	256K	128K	1536K	2	2 RU

## ■ Power Supply Module for the Cisco Catalyst 6840-X Series

SKU	Description	SKU	Description
C6840-X-750W-AC	750 W AC Power Supply Module	C6840-X-750W-DC	750 W DC Power Supply Module
C6840-X-1100W-AC	1100 W AC Power Supply Module	C6840-X-1100W-DC	1100 W DC Power Supply Module

## ■ Chassis for the Cisco Catalyst 6880-X Series

SKU	Slots for Port Card	Switching Capacity	Maximum Ports (equipped with Line Card)		Cisco IOS	Registered L3 Routes		Registered NetFlow	Slots for Power Supply Module	Rack Mount
			SFP +	QSFP <sup>3</sup>		IPv4	IPv6			
C6880-X-LE	4	2 Tbps	80	20	IP Services	256K	128K	512K	2	4.85 RU
C6880-X	4	2 Tbps	80	20	IP Services	2048K	1024K	512K	2	4.85 RU

## ■ Multi-rate Port Card for the Cisco Catalyst 6880-X Series

SKU	Per-slot Bandwidth	SFP/SFP+	Registered L3 Routes		Multicast Routes		MAC sec	Compatible Chassis	
			IPv4	IPv6	IPv4	IPv6		C6880-X-LE	C6880-X
C6880-X-LE-16P10G	80 Gbps	16	256K	128K	128K	128K	●	●	-
C6880-X-16P10G	80 Gbps	16	2048K	1024K	128K	128K	●	-	●

## ■ Power Supply Module for the Cisco Catalyst 6880-X Series

SKU	Description
C6880-X-3KW-AC	3000 W AC Power Supply Module
C6880-X-3KW-DC	3000 W DC Power Supply Module

## ■ Fan Tray for the Cisco Catalyst 6880-X Series

SKU	Description
C6880-X-FAN	Fan Tray for the Cisco Catalyst 6880-X Series

## ■ Chassis for the Cisco Catalyst 6807-XL

SKU	Slots		Maximum Ports (equipped with Line Card)						Slots for Power Supply Module	Rack Mount
	Supervisor Engine	Line Card	GE	SFP	SFP/SFP+	10GB-T	X2/SFP+	CFP/QSFP		
C6807-XL	2	5	240	240	160	80	80	20/40	4	10 RU



■ Supervisor Engine for the Cisco Catalyst 6807-XL

SKU	Switching Capacity	Equipped PFC	Equipped MSFC	Ports				Cisco IOS	Registered L3 Routes		Registered NetFlow
				SFP	SFP/SFP+	X2	QSFP		IPv4	IPv6	
VS-S2T-10G	2.08 Tbps	PFC4	MSFC5	3	-	2	-	IP Base	256K	128K	256K
VS-S2T-10G-XL	2.08 Tbps	PFC4XL	MSFC5	3	-	2	-	IP Base	1024K	512K	1024K
C6800-SUP6T	6 Tbps	PFC4	MSFC5	-	8	-	2	IP Services	256K	128K	512K
C6800-SUP6T-XL	6 Tbps	PFC4XL	MSFC5	-	8	-	2	IP Services	1024K	512K	1024K

■ Line Card for the Cisco Catalyst 6807-XL

SKU	Per-slot Bandwidth	Ports				Mac sec	VSL
DFC4-equipped model	DFC4XL-equipped model	GE	SFP	SFP/SFP+	X2/SFP+	CFP/QSFP	
WS-X6824-SFP-2T	WS-X6824-SFP-2TXL	20 Gbps	-	24	-	-	-
WS-X6848-TX-2T	WS-X6848-TX-2TXL	40 Gbps	48	-	-	-	-
C6800-48P-TX	C6800-48P-TX-XL	40 Gbps	48	-	-	-	-
WS-X6848-SFP-2T	WS-X6848-SFP-2TXL	40 Gbps	-	48	-	-	-
C6800-48P-SFP	C6800-48P-SFP-XL	40 Gbps	-	48	-	-	-
WS-X6816-10G-2T	WS-X6816-10G-2TXL	40 Gbps	-	-	16 <sup>*4</sup>	-	●
C6800-8P10G	C6800-8P10G-XL	80 Gbps	-	-	8	2 <sup>*5</sup>	●
C6800-16P10G	C6800-16P10G-XL	80 Gbps	-	-	16	4 <sup>*5</sup>	●
C6800-32P10G	C6800-32P10G-XL	160 Gbps	-	-	32	8 <sup>*5</sup>	●

■ Power Supply Module for the Cisco Catalyst 6807-XL

SKU	Description
C6800-XL-3KW-AC	3000 W AC Power Supply Module

■ Fan Tray for the Cisco Catalyst for 6807-XL

SKU	Description
C6807-XL-FAN	Fan Tray for Cisco Catalyst 6807-XL

■ Cisco Catalyst 6807-XL Bundle

SKU	Bundle				
	Chassis	Supervisor Engine	Power Supply Module	Fan Tray	Cisco IOS
C6807-XL-S2T-BUN	C6807-XL	VS-S2T-10G	C6800-XL-3KW-AC x 2	C6807-XL-FAN	IP Services

\*1 Cisco Catalyst 6840-X/6880-X Series supports the Cisco IOS IP Services/Advanced Enterprise Services.  
 \*2 SFP+ direct-attach breakout cable (QSFP-4SFP10G-CUXM, QSFP-4x10G-ACxM) or SFP+ Active Optical breakout Cable (QSFP-4X10G-AOCxM) is required to mount SFP/SFP+ module.  
 \*3 QSFP Converter (CVR-4SFP10G-QSFP on roadmap) is required to mount QSFP module.\*4 SFP+ Converter (CVR-X2-SFP10G) is required to mount SFP+ module.  
 \*5 QSFP Active Optical breakout Cable (QSFP-4X10G-AOCxM) or QSFP Converter (CVR-4SFP10G-QSFP on roadmap) is required to mount QSFP module.

## Cisco Nexus 7700 Switches

The Cisco Nexus 7700 Switches are the latest extension to the Cisco Nexus 7000 Series modular switches. With more than 83 terabits per second (Tbps) of overall switching capacity, the Cisco Nexus 7700 Switches deliver the highest-capacity 10, 40, and 100 Gigabit Ethernet ports in the industry, with up to 768 native 10-Gbps ports, 384 40-Gbps ports, or 192 100-Gbps ports. This high system capacity is designed to meet the scalability requirements of the largest cloud environments.

The Cisco Nexus 7700 switches (Figure 1) have operational and feature consistency with the existing Cisco Nexus 7000 Series Switches, using common system architecture, the same application-specific integrated circuit (ASIC) technology, and the same proven Cisco NX-OS Software releases.



■ A La Carte Part Numbers for Cisco DNA Advantage for Cisco Nexus 7000 Series

License type	Term	Product ID
Cisco DNA Advantage	3 years	N7000-DNA-A-3YR
	5 years	N7000-DNA-A-5YR
	7 years	N7000-DNA-A-7YR

Please contact your account team for additional ordering information such as Cisco ONE packaging.

The minimum Base license for activating Cisco DNA Advantage is the LAN Enterprise license (N77-LAN1K9).

■ Cisco Nexus 7000 Chassis

	Supervisor redundancy	I/O module slots	Bandwidth per slot (Gbps)	Switching capacity (Tbps)	1 GE port density	10 GE port density	40 GE port density	100 GE port density	Rack space (RU)	Airflow
7000 4-slot	Yes	2	440 Gbps	1.92	96	96	24	12	7	Side-rear
7000 9-slot	Yes	7	550 Gbps	7.7	336	336	84	42	14	Side-side
7000 10-slot	Yes	8	550 Gbps	8.8	384	384	96	48	21	Front-back
7000 18-slot	Yes	16	550 Gbps	17.6	768	768	192	96	25	Side-side
7700 2-slot <span style="color: green;">SMA Ready</span>	No	1	1.3 Tbps	5	48	48	24	12	3	Front-back
7700 6-slot <span style="color: green;">SMA Ready</span>	Yes	4	1.3 Tbps	21	192	192	96	48	9	Front-back
7700 10-slot <span style="color: green;">SMA Ready</span>	Yes	8	1.3 Tbps	42	384	384	192	96	14	Front-back
7700 18-slot <span style="color: green;">SMA Ready</span>	Yes	16	1.3 Tbps	83	768	768	384	192	26	Front-back

Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB



Software

Financing






Cisco Services

Programs & Promotions

## ■ Cisco Nexus 7000 Supervisors

	CPU	Speed (GHz)	Memory (GB)	Flash Memory	Fibre Channel over Ethernet on F2 module	CPU share	Virtual Device Contexts (VDCs)	Cisco Fabric Extender (FEX) support	Connectivity Management Processor (CMP)
Nexus 7700 Supervisor 2E 	Dual Quad-Core Xeon	2.13	32	USB	Yes	Yes	8+1 admin VDC	64 FEX/3072 ports	Not supported
Nexus 7000 Supervisor 2E 	Dual Quad-Core Xeon	2.13	32	USB	Yes	Yes	8+1 admin VDC	64 FEX/3072 ports	Not supported
Nexus 7000 Supervisor 2	Quad-Core Xeon	2.13	12	USB	Yes	Yes	4+1 admin VDC	32 FEX/1536 ports	Not supported
Nexus 7000 Supervisor 1	Dual-Core Xeon	1.66	8	Compact Flash	No	No	4	32 FEX/1536 ports	Not supported

## ■ Cisco Nexus 7000 M Modules

	Line card family	Chassis supported	Ports (number and type)	Interface type	Fabric bandwidth (Gbps)	Performance (Mpps)	NetFlow		Virtual Port Channel (vPC) support	FabricPath	VXLAN
N7K-M224XP-23L	M2	Cisco Nexus 7000	24 x 10 GE	SFP+	240	120	Full/	sampled	Yes	No	No
N7K-M206FQ-23L	M2	Cisco Nexus 7000	6 x 40 GE	QSFP+	240	120	Full/	sampled	Yes	No	No
N7K-M202CF-22L	M2	Cisco Nexus 7000	2 x 40/100 GE	CFP	200	120	Full/	sampled	Yes	No	No
N7K-M348XP-25L 	M3	Cisco Nexus 7000	48 x 1/10 GE	SFP, SFP+	480	720	-	sampled	Yes	Yes	Yes
N7K-M324FQ-25L 	M3	Cisco Nexus 7000	24 x 40 GE	QSFP+	550	1440	-	sampled	Yes	Yes	Yes
N77-M348XP-23L 	M3	Cisco Nexus 7700	48 x 1/10 GE	SFP, SFP+	480	720	-	sampled	Yes	Yes	Yes
N77-M324FQ-25L 	M3	Cisco Nexus 7700	24 x 40 GE	QSFP+	960	1440	-	sampled	Yes	Yes	Yes
N77-M312CQ-26L 	M3	Cisco Nexus 7700	12 x 100G	QSFP28	1200	1800	-	sampled	Yes	Yes	Yes

## ■ Cisco Nexus 7000 F Modules

	Line card family	Chassis supported	Ports (number and type)	Interface type	Fabric bandwidth (Gbps)	Performance (Mpps)	NetFlow
N7K-F248XP-25E	F2e	Cisco Nexus 7000	48 ports, 1 and 10 GE	SFP, SFP+	480	720	Sampled
N7K-F248XT-25E	F2e	Cisco Nexus 7000	48 ports, 1 and 10 GE	RJ45	480	720	Sampled
N7K-F348XP-25	F3	Cisco Nexus 7000	48 port 1 and 10 GE	SFP, SFP+	480	720	Sampled
N7K-F312FQ-25	F3	Cisco Nexus 7000	12 port 40 GE	Quad Small Form Factor Pluggable Plus (QSFP+), Bidirectional (Bidi)	480	720	Sampled
N7K-F306CK-25	F3	Cisco Nexus 7000	6 port 100 GE	Cisco CPAK	480	900	Sampled
N77-F348XP-23	F3	Cisco Nexus 7700	48 port 1 and 10 GE	SFP, SFP+	480	720	Sampled
N77-F324FQ-25	F3	Cisco Nexus 7700	24 port 40 GE	QSFP+, Bidi	960	1440	Sampled
N77-F312CK-26	F3	Cisco Nexus 7700	12 port 100 GE	Cisco CPAK	1200	1800	Sampled

BGP-EVPN	Encryption	Cisco TrustSec	FEX support	QinQ	MPLS	Overlay Transport Virtualization (OTV)	Locator/ID Separation Protocol (LISP)	FCoE	FCoE and FabricPath	IEEE 1588 PTP	PONG	F-Series Interoperability in the same VDC
No	128-bit	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
No	128-bit	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
No	128-bit	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Yes	128- and 256-bit	Yes	Yes	Yes	Yes	Yes	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Yes
Yes	128- and 256-bit	Yes	Yes	Yes	Yes	Yes	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Yes
Yes	128- and 256-bit	Yes	Yes	Yes	Yes	Yes	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Yes
Yes	128- and 256-bit	Yes	Yes	Yes	Yes	Yes	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Yes
Yes	128- and 256-bit	Yes	Yes	Yes	Yes	Yes	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Hardware-ready	Yes

Cisco Fabric Extender (FEX) support	Virtual Port Channel (vPC) support	FabricPath support	Layer 3 interface	Fibre Channel over Ethernet (CoE), FabricPath support	Overlay Transport Virtualization (OTV), Cisco Locator/ID Separation Protocol (LISP), Multiprotocol Label Switching (MPLS)	VXLAN/EVPN	M-Series Interoperability in same VDC
Yes	Yes	Yes	Yes	Yes		No	Yes
Yes	Yes	Yes	Yes	Yes		No	Yes
Yes	Yes	Yes	Yes	Yes		Hardware Ready	Yes
Yes	Yes	Yes	Yes	Yes		Hardware Ready	Yes
Yes	Yes	Yes	Yes	Yes		Hardware Ready	Yes
Yes	Yes	Yes	Yes	Yes		Hardware Ready	Yes
Yes	Yes	Yes	Yes	Yes		Hardware Ready	Yes
Yes	Yes	Yes	Yes	Yes		Hardware Ready	Yes

# Cisco Catalyst 9300 Series Switches

The Cisco® Catalyst® 9300 Series Switches are Cisco's lead stackable enterprise switching platform built for security, IoT, mobility, and cloud. They are the next generation of the industry's most widely deployed switching platform. The Catalyst 9300 Series switches form the foundational building block for Software-Defined Access (SD-Access), Cisco's lead enterprise architecture. At 480 Gbps, they are the industry's highest-density stacking bandwidth solution with the most flexible uplink architecture. The Catalyst 9300 Series is the first optimized platform for high-density 802.11ac Wave2. It sets new maximums for network scale. These switches are also ready for the future, with an x86 CPU architecture and more memory, enabling them to host containers and run third-party applications and scripts natively within the switch.

The Catalyst 9300 Series is designed for Cisco StackWise® technology, providing flexible deployment with support for nonstop forwarding with stateful switchover (NSF/SSO), for the most resilient architecture in a stackable (sub-50-ms) solution. The highly resilient and efficient power architecture features Cisco StackPower®, which delivers high-density Cisco Universal Power



Over Ethernet (Cisco UPOE®) and Power over Ethernet Plus (PoE+) ports. The switches are based on the Cisco Unified Access™ Data Plane 2.0 (UADP) 2.0 architecture which not only protects your investment but also allows a larger scale and higher throughput. A modern operating system, open Cisco IOS XE with programmability offers advanced security capabilities and Internet of Things (IoT) convergence.

## ■ Cisco Catalyst 9300 Series Switch Configurations

Model	Total 10/100/1000 or Multigigabit copper ports	Default AC power supply	Available PoE power	Cisco StackWise - 480	Cisco StackPower
C9300-24T	24	350W AC		Yes	Yes
C9300-48T	48	350W AC		Yes	Yes
C9300-24P	24 POE+	715W AC	445W	Yes	Yes
C9300-48P	48 POE+	715W AC	437W	Yes	Yes
C9300-24U	24 Cisco UPOE	1100W AC	830W	Yes	Yes
C9300-48U	48 Cisco UPOE	1100W AC	822W	Yes	Yes
C9300-24UX	24 Multigigabit Cisco UPOE (100 Mbps or 1, 2.5, 5, or 10 Gbps)	1100W AC	560W	Yes	Yes

## ■ Network Module Numbers and Descriptions

Network module	Description
C9300-NM-4G	9300 Series 4x 1G Network Module
C9300-NM-8X	9300 Series 8x 10G Network Module
9300-NM-2Q	9300 Series 2x 40G Network Module

Please note: Existing 3850 network modules are also supported in the Cisco Catalyst 9300 Series platforms.

## ■ Power Supply Models

Models	Default power supply	Available PoE power
24-port data switch	PWR-C1-350WAC	-
48-port data switch	PWR-C1-350WAC	
24-port PoE+ switch	PWR-C1-715WAC	445W
48-port PoE+ switch	PWR-C1-715WAC	437W
24-port Cisco UPOE switch	PWR-C1-1100WAC	830W
48-port Cisco UPOE switch	PWR-C1-1100WAC	822W
24-port Multigigabit Cisco UPOE switch	PWR-C1-1100WAC	490W - Support in Open Cisco IOS XE 16.6

## ■ A La Carte Part Numbers for DNA Advantage for the Cisco Catalyst 9300 Series

License type	Product ID	Description
	C9300-DNA-A-24-3Y	C9300 DNA Advantage, 24-port, 3-year term license
	C9300-DNA-A-24-5Y	C9300 DNA Advantage, 24-port, 5-year term license
	C9300-DNA-A-24-7Y	C9300 DNA Advantage, 24-port, 7-year term license
	C9300-DNA-A-48-3Y	C9300 DNA Advantage, 48-port, 3-year term license
	C9300-DNA-A-48-5Y	C9300 DNA Advantage, 48-port, 5-year term license
	C9300-DNA-A-48-7Y	C9300 DNA Advantage, 48-port, 7-year term license

## ■ Cisco ONE Software Part Numbers for DNA Advantage for Cisco Catalyst 9300 Series

License type	Product ID	Description
	C1A1TCAT93001	Cisco ONE Advantage term, C9300 DNA + 25-session starter
Cisco ONE Advantage	C1A1ATACT93001	Cisco ONE Advantage Upgrade term, C9300 24-port*
	C1A1TCAT93002	Cisco ONE Advantage term, C9300 48-port
	C1A1ATACT93002	Cisco ONE Advantage Upgrade term, C9300 48-port*

\*All midcycle refresh option PIDs are available under C1-CAT-ADD-T.

The Base License for DNA Advantage is Network Advantage. As such, only the Hardware PIDs with "-A" suffix must be chosen.

The Base license for Cisco DNA Advantage is Network Advantage. As such, only hardware PIDs with the "-A" suffix must be chosen.



# Cisco Catalyst 9400 Series Switches

The Cisco Catalyst® 9400 Series switches are Cisco's leading modular enterprise switching access platform built for security, IoT and cloud. These switches form the foundational building block for SD-Access – Cisco's lead enterprise architecture. The platform provides unparalleled investment protection with a chassis architecture that is capable of supporting up to 9Tbps of system bandwidth and unmatched power delivery for high density IEEE 802.3BT (60W PoE). Redundancy is now table stakes across the portfolio. The Catalyst 9400 delivers state-of-the-art High Availability (HA) with capabilities like uplink resiliency, N+1/N+N redundancy for power supplies. The platform is enterprise optimized with an innovative dual-serviceable fan tray design, side to side airflow and is closet-friendly with ~16" depth. A single system can scale up to 384 access ports with your choice of 1G copper UPoE and PoE+ options. The platform also supports advanced routing and infrastructure services, SD-Access capabilities and network system virtualization. These features enable optional placement of the platform in the core and aggregation layers of small to medium-sized campus environments.



## ■ Cisco Catalyst 9300 Series Switch Configurations

Feature	Cisco Catalyst C9407R Chassis	Cisco Catalyst C9410R Chassis
Total number of slots	7	10
Line-card slots	5	8
Supervisor engine slots	2 <sup>1</sup>	2 <sup>2</sup>
Dedicated supervisor engine slot numbers	3 and 4 <sup>3</sup>	5 and 6 <sup>3</sup>
Supervisor engine redundancy	Yes	Yes
Supervisor engines supported	C9400-SUP-1	C9400-SUP-1
Maximum PoE per slot	2880W <sup>4</sup>	2880W <sup>4</sup>
Maximum Bandwidth scalability per line-card slot	Up to 480 Gbps on all slots <sup>5</sup>	Up to 480 Gbps on all slots <sup>5</sup>
Number of power supply bays	8	8
AC input power	Yes	Yes
Integrated PoE	Yes	Yes
Power supplies supported	3200W AC	3200W AC
Number of fan-tray bays	1	1
Location of 19-inch rack-mount	Front	Front

<sup>1</sup> Slots 3 and 4 are reserved for supervisor engines only in Cisco Catalyst C9407R; slots 1-2 and 5-7 are reserved for line cards.

<sup>2</sup> Slots 5 and 6 are reserved for supervisor engines only in Cisco Catalyst C9410R; slots 1-4 and 7-10 are reserved for line cards.

<sup>3</sup> Linecards are not supported in the Supervisor slots.

<sup>4</sup> Max PoE mentioned is as per the current shipping linecard, however chassis is capable ~4800W PoE per slot.

<sup>5</sup> 80Gbps per line-card slot when used with C9400-SUP-1

## ■ Cisco Catalyst 9400 Series supervisor engine maximum bandwidth per slot

Feature	Cisco Catalyst 9400 Series Supervisor Engine C9400-SUP-1
Cisco Catalyst C9407R chassis	80 Gbps/slot
Cisco Catalyst C9410R chassis	80 Gbps/slot

The table lists the minimum software requirements for the Cisco Catalyst 9400 supervisor engine.

## ■ Cisco catalyst supervisor engine software minimum requirements

Chassis	Supervisor Engine	Minimum Software Requirement
Cisco C9407R	Supervisor Engine C9400-SUP-1	Cisco Open IOS-XE Software Release 16.6.1
Cisco C9410R	Supervisor Engine C9400-SUP-1	Cisco Open IOS-XE Software Release 16.6.1

The table lists the minimum software requirements for the Cisco Catalyst 9400 supervisor engine.

## ■ Cisco Catalyst 9400 Series line cards

Product Number	Description	Minimum Software Requirement
Cisco Catalyst 9400 Series Line Cards		
C9400-LC-48U	Cisco Catalyst 9400 Series 48-Port UPOE 10/100/1000 (RJ-45)	Cisco Open IOS-XE Software Release 16.6
C9400-LC-48UX	Cisco Catalyst 9400 Series 48-Port UPOE w/ 24p mGig 24p RJ-45	Cisco Open IOS-XE Software Release 16.6
C9400-LC-48T	Cisco Catalyst 9400 Series 48-Port 10/100/1000 (RJ-45)	Cisco Open IOS-XE Software Release 16.6
C9400-LC-24XC	Cisco Catalyst 9400 Series 24-Port Gigabit Ethernet (SFP+)	Cisco Open IOS-XE Software Release 16.6

The Cisco Catalyst 9400 Series has flexible interface types and port densities that allow you to mix and match network configurations to meet the specific needs of campus networks.

## ■ Cisco Catalyst 9400 Series maximum port densities

Cisco Catalyst 9400 Series Switching Modules	Cisco Catalyst C9407R	Cisco Catalyst C9410R
10/100/1000BASE-T Gigabit (RJ-45) ports	240	384
10/100/1000BASE-T Gigabit Ethernet with POE+ ports	240	384
Switched 10/100/1000BASE-T Gigabit Ethernet with UPOE ports	240	384

Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

Cisco Services

Programs & Promotions

## Physical specifications

### ■ Cisco Catalyst 9400 Series power supply specifications

Power Supply	3200W AC
Integrated PoE	Yes
Input current (rated)	16A at 100 VAC 16A at 200 VAC
Input voltage	100 to 240 VAC ( $\pm 10\%$ for full range)
Output current (data)	55V at 58.0A/28.36A (230/115VAC ranges) 3.3V at 3.0A
Output power (N+N) redundant mode (PoE + data)	(3190W x N)/2 + 10W (3.3V standby) for 230VAC range (1560W x N)/2 + 10W (3.3V standby) for 115VAC range N = number of power supplies (N>1)
Output power (N+1) redundant mode (PoE + data)	(3190W x (N-1)) + 10W (3.3V standby) for 230VAC range (1560W x (N-1)) + 10W (3.3V standby) for 115VAC range N = number of power supplies (N>1)
Output Power Combined mode (PoE + data)	(3190W x N) + 10W (3.3V standby) for 230VAC range (1560W x N) + 10W (3.3V standby) for 115VAC range N = number of power supplies (N>1)
Heat dissipation	950 BTU/hr x N N = number of power supplies
Holdup time	20 ms
Hot swappable	Yes
MTBF	300,000 hours

Note:

- Output power is per power supply unless otherwise stated.
- Heat-dissipation numbers represent the power conversion losses of the power supply in operation.
- The number of power devices supported depends upon the customer configuration.

### ■ A La Carte Part Numbers for Cisco DNA Advantage for the Cisco Catalyst 9400 Series

License type	Product ID	Description
Advantage	C9400-DNA-A-3Y	C9400 DNA Advantage, 3-year term license
	C9400-DNA-A-5Y	C9400 DNA Advantage, 5-year term license
	C9400-DNA-A-7Y	C9400 DNA Advantage, 7-year term license

### ■ Cisco ONE Software Numbers for DNA Advantage for the Cisco Catalyst 9400 Series

License type	Product ID	Description
Cisco ONE Advantage	C1A1TCAT94001	Cisco ONE Advantage term, C9400

The Base license for Cisco DNA Advantage is Network Advantage. As such, only hardware PIDs with the "-A" suffix must be chosen.

## Cisco Catalyst 9500 Series Switches

The Cisco® Catalyst® 9500 Series Switches are the next generation of Enterprise-Class Core and Aggregation layer switches based on x86 CPU which support full programmability and serviceability. The Cisco® Catalyst® 9500 is Cisco's lead purpose-built fixed core/aggregation enterprise switching platform built for security, IoT and Cloud. These switches form the foundational building block for SD-Access - Cisco's lead enterprise architecture. The Cisco® Catalyst® 9500 Series Switches come with 4-Core 2.4GHz CPU, 16GB DDR4 memory and 16GB internal storage. The Cisco® Catalyst® 9500 is industry's first purpose built 40G switch targeted for enterprise campus, delivering unmatched table scales (MAC/route/ACL) and buffering for enterprise applications. The platform offers non-blocking 40G (QSFP) and 10G (SFP+) switches with granular port densities that fit diverse campus needs. Catalyst 9500 supports advanced routing/infrastructure services (MPLS L2/L3 VPNs, MVPN, NAT), SD-Access border capabilities (host tracking database, cross domain connectivity and VRF aware LISP) and network system virtualization with Stackwise virtual technology that are critical for its placement in the campus core. The platform also supports all the foundational HA capabilities like patching, GIR, NSF/SSO, redundant platinum rated power supplies and fans.



Figure 1. Cisco Catalyst 9500 Series Switches - 24 x 40 Gigabit Ethernet



Figure 2. Cisco Catalyst 9500 Series Switches - 12 x 40 Gigabit Ethernet



Figure 3. Cisco Catalyst 9500 Series Switches - 40 x 1/10 Gigabit Ethernet

#### ■ Cisco Catalyst 9500 Series configurations

Model	Description	Total QSFP or SFP+ Ports
C9500-24Q	Cisco Catalyst 9500 Series 24-port 40 Gigabit Ethernet with QSFP+	24 QSFP+ (or up to 24 SFP+ with QSA adapter)
C9500-12Q	Cisco Catalyst 9500 Series 12-port 40 Gigabit Ethernet with QSFP+	12 QSFP+ (or up to 12 SFP+ with QSA adapter)
C9500-40X	Cisco Catalyst 9500 Series 40-port 1/10 Gigabit Ethernet with SFP/SFP+	40 SFP/SFP+

#### ■ Network module numbers and descriptions

Model	Description
C9500-NM-8X	Cisco Catalyst 9500 Series Network Module 8-port 1/10 Gigabit Ethernet with SFP/SFP+
C9500-NM-2Q	Cisco Catalyst 9500 Series Network Module 2-port 40 Gigabit Ethernet with QSFP+

#### ■ Power supply models

Model	Description
Cisco Catalyst 9500 Series 12-port 40 Gigabit Ethernet with QSFP	PWR-C4-950WAC-R
Cisco Catalyst 9500 Series 24-port 40 Gigabit Ethernet with QSFP+	PWR-C4-950WAC-R
Cisco Catalyst 9500 Series 40-port 1/10 Gigabit Ethernet with SFP/SFP+	PWR-C4-950WAC-R

#### ■ Cisco Catalyst 9500 performance specifications

Performance Numbers for All Switch Models	C9500-12Q	C9500-24Q	C9500-40X
Switching capacity	Up to 480 Gbps full duplex	Up to 960 Gbps full duplex	Up to 480 Gbps full duplex
Forwarding rate	Up to 720 Mpps	Up to 1440 Mpps	Up to 720 Mpps
Total number of MAC addresses	Up to 64K*		
Total number of IPv4 routes (Address Resolution Protocol [ARP] plus learned routes)	Up to 64K indirect* Up to 32K host*		
Total number of IPv6 routes	Up to 32K indirect* Up to 16K host*		
Multicast scale	Up to 48K*		
QoS ACL Scale	Up to 48K*		

Performance Numbers for All Switch Models	C9500-12Q	C9500-24Q	C9500-40X
Security ACL scale	Up to 18K*		
FNF entries	Up to 512K*		
DRAM	16 GB		
Flash	16 GB		
VLAN IDs	4K		
Total Switched Virtual Interfaces (SVIs)	4K		
Jumbo frame	9198 bytes		

\*Varies based on selected flexible ASIC template.

#### ■ A La Carte Part Numbers for Cisco DNA Advantage for the Cisco Catalyst 9500 Series

License type	Product ID	Description
Advantage (low density)	C9500-DNA-L-A	C9500 DNA Advantage, low density term licenses
	C9500-DNA-L-A-3Y	C9500 DNA Advantage, low density, 3-year term license
	C9500-DNA-L-A-5Y	C9500 DNA Advantage, low density, 5-year term license
	C9500-DNA-L-A-7Y	C9500 DNA Advantage, low density, 7-year term license
Advantage (high density)	C9500-DNA-A	C9500 DNA Advantage, high density term licenses
	C9500-DNA-A-3Y	C9500 DNA Advantage, high density, 3-year term license
	C9500-DNA-A-5Y	C9500 DNA Advantage, high density, 5-year term license
	C9500-DNA-A-7Y	C9500 DNA Advantage, high density, 7-year term license

#### ■ Cisco ONE Part Numbers for Cisco DNA Advantage for the Cisco Catalyst 9500 Series

License type	Product ID	Description
Cisco ONE Advantage	C1A1TCAT95001	Cisco ONE Advantage term, C9500
	C1A1ATCAT95001	Cisco ONE Advantage Upgrade term, C9500

# Cisco Catalyst 4500/6500/6800 Series Transition Guide

## ■ Chassis for the Cisco Catalyst 4500 Series

Legacy Models	Current Models
WS-C4503 <sup>*1</sup>	WS-C4503-E / C9407R
WS-C4506 <sup>*1</sup>	WS-C4506-E / C9407R
WS-C4507R-E <sup>*2</sup>	WS-C4507R+E / C9407R
WS-C4510R-E <sup>*2</sup>	WS-C4510R+E / C9410R

## ■ Supervisor Engine for the Cisco Catalyst 4500 Series

Legacy Models	Current Models
WS-X4516-10GE <sup>*3</sup>	WS-X45-SUP8L-E WS-X45-SUP8-E / WS-X45-SUP9-E
WS-X45-SUP6L-E <sup>*4</sup>	WS-X45-SUP8L-E
WS-X45-SUP6-E <sup>*5</sup>	WS-X45-SUP8-E / WS-X45-SUP9-E

## ■ Line Card for the Cisco Catalyst 4500 Series

Legacy Models	Current Models
WS-X4148-RJ <sup>*6</sup>	WS-X4748-RJ45-E
WS-X4248-RJ45V <sup>*7</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4306-GB <sup>*8</sup>	WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4418-GB <sup>*9</sup>	WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4506-GB-T <sup>*9</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4548-GB-RJ45 <sup>*3</sup>	WS-X4748-RJ45-E
WS-X4524-GB-RJ45V <sup>*10</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4548-GB-RJ45V <sup>*3</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4548-RJ45V <sup>*11</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4648-RJ45-E <sup>*12</sup>	WS-X4748-RJ45-E
WS-X4548-RJ45V <sup>*11</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4648-RJ45V+E <sup>*12</sup>	WS-X4748-RJ45V+E WS-X4748-UPOE+E WS-X4748-12X48U+E
WS-X4612-SFP-E <sup>*12</sup>	WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E
WS-X4624-SFP-E <sup>*12</sup>	WS-X4712-SFP-E WS-X4724-SFP-E WS-X4748-SFP-E

## ■ Chassis for the Cisco Catalyst 6500/6800 Series

Legacy Models	Current Models
WS-C6503 <sup>*13</sup>	C6807-XL
WS-C6506 <sup>*13</sup>	C6807-XL
WS-C6509 <sup>*13</sup>	C6807-XL
WS-C6509-NEB <sup>*14</sup>	WS-C6509-V-E
WS-C6509-NEB-A <sup>*15</sup>	WS-C6509-V-E
WS-C6513 <sup>*16</sup>	WS-C6513-E

## ■ Supervisor Engine for the Cisco Catalyst 6500/6800 Series

Legacy Models	Current Models (PFC4)	Current Models (PFC4XL)
WS-SUP32-GE-3B <sup>*17</sup>	VS-S2T-10G / C6800-SUP6T	VS-S2T-10G-XL / C6800-SUP6T
WS-SUP32-10GE-3B <sup>*17</sup>	VS-S2T-10G / C6800-SUP6T	VS-S2T-10G-XL / C6800-SUP6T
WS-SUP720-3B <sup>*18</sup>	VS-S2T-10G / C6800-SUP6T	VS-S2T-10G-XL / C6800-SUP6T
WS-SUP720-3BXL <sup>*18</sup>	-	VS-S2T-10G-XL / C6800-SUP6T
VS-S720-10G-3C <sup>*19</sup>	VS-S2T-10G / C6800-SUP6T	VS-S2T-10G-XL / C6800-SUP6T
VS-S720-10G-3CXL <sup>*19</sup>	-	VS-S2T-10G-XL / C6800-SUP6T

## ■ Line Card for the Cisco Catalyst 6500/6800 Series

Legacy Models	Current Models (PFC4)	Current Models (PFC4XL)
WS-X6148-FE-SFP <sup>*20</sup>	WS-X6848-SFP-2T C6800-48P-SFP	WS-X6848-SFP-2TXL C6800-48P-SFP
WS-X6148A-GE-TX <sup>*21</sup>	WS-X6848-TX-2T	WS-X6848-TX-2TXL
WS-X6548-GE-TX <sup>*20</sup>	WS-X6848-TX-2T	WS-X6848-TX-2TXL
WS-X6516A-GBIC <sup>*20</sup>	WS-X6824-SFP-2T	WS-X6824-SFP-2TXL
WS-X6724-SFP <sup>*19</sup>	WS-X6824-SFP-2T	WS-X6824-SFP-2TXL
WS-X6748-GE-TX <sup>*22</sup>	C6800-48P-TX	C6800-48P-TX-XL
WS-X6748-SFP <sup>*22</sup>	WS-X6848-SFP-2T C6800-48P-SFP	WS-X6848-SFP-2TXL C6800-48P-SFP
WS-X6716-10T-3C <sup>*19</sup>	-	-
WS-X6716-10T-3CXL <sup>*19</sup>	-	-
WS-X6716-10G-3C <sup>*19</sup>	WS-X6816-10G-2T C6800-16P10G	-
WS-X6716-10G-3CXL <sup>*19</sup>	-	WS-X6816-10G-2TXL C6800-16P10G-XL
WS-X6708-10G-3C <sup>*22</sup>	C6800-8P10G	-
WS-X6708-10G-3CXL <sup>*22</sup>	-	C6800-16P10G-XL
WS-X6908-10G-2T <sup>*22</sup>	C6800-8P10G	-
WS-X6908-10G-2TXL <sup>*22</sup>	-	C6800-16P10G-XL
WS-X6904-40G-2T <sup>*22</sup>	C6800-16P10G C6800-32P10G	-
WS-X6904-40G-2TXL <sup>*22</sup>	-	C6800-16P10G-XL C6800-32P10G-XL
WS-X6816-10T-2T <sup>*22</sup>	-	-
WS-X6816-10T-2TXL <sup>*22</sup>	-	-

\*1 Search for EOL6869 at cisco.com.\*2 Search for EOL8168 at cisco.com.\*3 Search for EOL8162 at cisco.com.\*4 Search for EOL9604 at cisco.com.

\*5 Search for EOL8975 at cisco.com.\*6 Search for EOL9420 at cisco.com.\*7 Search for EOL9424 at cisco.com.\*8 Search for EOL8969 at cisco.com.

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\*13 Search for EOL3037 at cisco.com.\*14 Search for EOL6564 at cisco.com.\*15 Search for EOL6720 at cisco.com.\*16 Search for EOL8193 at cisco.com.

\*17 Search for EOL7769 at cisco.com.\*18 Search for EOL8147 at cisco.com.\*19 Search for EOL9892 at cisco.com.\*20 Search for EOL7770 at cisco.com.

\*21 Search for EOL9058 at cisco.com.\*22 Search for EOL10550 at cisco.com.



# Modules & Accessories

## ■ Cisco Redundant Power System (RPS) 2300

SKU	Description	Compatible Series									
		2960-CX	3560-CX	2960-Plus	2960-X	3650	3850	4500E	4500-X	6500	6800
PWR-RPS2300	Cisco RPS 2300 Chassis	-	-	-	● <sup>*3</sup>	● <sup>*3</sup>	-	-	-	-	● <sup>*4</sup>
C3K-PWR-750WAC	750 W AC Power Supply Module for Cisco RPS 2300	-	-	-	● <sup>*1</sup> ● <sup>*2</sup>	● <sup>*3</sup>	-	-	-	-	● <sup>*4</sup>
CAB-RPS2300=	Spare 14-pin RPS Cable for Cisco RPS 2300	-	-	●	- <sup>*1</sup> - <sup>*2</sup>	-	-	-	-	-	-
CAB-RPS2300-E=	Spare 22-pin RPS Cable for Cisco RPS 2300	-	-	-	●	● <sup>*3</sup>	-	-	-	-	● <sup>*4</sup>

## ■ Cisco Transceiver Module

SKU	Description	Compatible Series									
		2960-CX	3560-CX	2960-Plus	2960-X	3650	3850	4500E	4500-X	6500	6800
GLC-GE-100FX	100BASE-FX SFP Module	●	●	●	●	●	●	●	-	●	●
GLC-T	1000BASE-T SFP Module	-	-	●	●	●	●	●	●	●	●
GLC-SX-MMD	1000BASE-SX SFP Module (DOM)	●	●	●	●	●	●	●	●	●	●
GLC-LH-SMD	1000BASE-LX SFP Module (DOM)	●	●	●	●	●	●	●	●	●	●
GLC-BX-D	1000BASE-BX SFP Module (1490 nm)	●	●	●	●	●	●	●	●	●	●
GLC-BX-U	1000BASE-BX SFP Module (1310 nm)	●	●	●	●	●	●	●	●	●	●
GLC-EX-SMD	1000BASE-EX SFP Module	●	●	-	●	●	●	●	●	●	●
GLC-ZX-SMD	1000BASE-ZX SFP Module	●	●	●	●	●	●	●	●	●	●
SFP-10G-SR	10GBASE-SR SFP+ Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-LR	10GBASE-LR SFP+ Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-LRM	10GBASE-LRM SFP Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-ER	10GBASE-ER SFP+ Module	-	●	-	●	●	●	●	●	●	●
SFP-10G-SR-S	Cisco 10GBASE-SR SFP+ Module for MMF	-	●	-	●	●	●	●	●	●	●
SFP-10G-LR-S	Cisco 10GBASE-LR SFP+ Module for SMF	-	●	-	●	●	●	●	●	●	●
SFP-10G-ER-S	Cisco 10GBASE-ER SFP+ Module for SMF	-	●	-	●	●	●	●	●	●	●
SFP-10G-ZR-S	Cisco 10GBASE-ZR SFP+ Module for SMF	-	●	-	●	●	●	●	●	●	●
SFP-10G-ZR	Cisco 10GBASE-ZR SFP+ Module for SMF	-	●	-	●	●	●	●	●	●	●
X2-10GB-CX4	10GBASE-CX4 X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
X2-10GB-LRM	10GBASE-LRM X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
X2-10GB-SR	10GBASE-SR X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
X2-10GB-LR	10GBASE-LR X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
X2-10GB-ER	10GBASE-ER X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
X2-10GB-ZR	10GBASE-ZR X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
CVR-X2-SFP	TwinGig Converter for X2 Module	-	-	-	-	-	-	●	-	-	-
CVR-X2-SFP10G	SFP+ Converter for X2 Module	-	-	-	-	-	-	●	-	●	● <sup>*5</sup>
CFP-40G-SR4	40GBASE-SR4 CFP Module	-	-	-	-	-	-	-	-	●	● <sup>*5</sup>
CFP-40G-LR4	40GBASE-LR4 CFP Module	-	-	-	-	-	-	-	-	●	● <sup>*5</sup>
CVR-CFP-4SFP10G	FourX SFP+ Converter for CFP Module	-	-	-	-	-	-	-	-	●	● <sup>*5</sup>
CVR-QSFP-SFP10G	SFP/SFP+ Converter for QSFP Module	-	-	-	-	-	-	-	-	●	● <sup>*5</sup>
CVR-4SFP10G-QSFP	QSFP Converter for SFP+ Module	-	-	-	-	-	-	●	●	●	●

\*1 LAN Lite model does not support stacking.\*2 IP Lite model is not supported.\*3 Mini models only.\*4 Cisco Catalyst 6880-Series and Cisco Catalyst 6807-XL are not supported.  
\*5 Cisco Catalyst 6880-X is not supported.

## Ports

Cisco Catalyst Switches support the following interface ports for uplink and downlink connections:

- Fast Ethernet port (FE)
- Gigabit Ethernet port (GE)
- Multigigabit Ethernet port (mGig)
- SFP module slot (SFP)
- Dual-Purpose port (GE/SFP)
- 10GBASE-T port (10GB-T)
- X2 module slot (X2)
- SFP+ module slots (SFP/SFP+)
- CFP module slot (CFP)
- QSFP module slot (QSFP)

The bracketed notations are abbreviations used in the specification comparison tables in this catalog. A dual-purpose port is an interface combining a Gigabit Ethernet port with an SFP module slot and is notated as GE/SFP (Either one can be activated independently). Similarly, SFP+ module slots are notated as SFP/SFP+ due to their compatibility with SFP. SFP/SFP+ modules can be mounted to X2, CFP, or QSFP module slots using an appropriate converter. In most cases, the supported port interfaces and number of ports of each product can be determined from their SKU (Refer to page 14 for details).

### ■ Ports Supported by Fixed-Configuration Cisco Catalyst Switches (e.g.)

#### ● Uplink

- Gigabit Ethernet port (GE)
- SFP module slot (SFP)
- Dual-Purpose port (GE/SFP)
- 10GBASE-T port (10 GB-T)
- SFP+ module slot (SFP/SFP+)
- QSFP module slot (QSFP)



#### ● Downlink

- Fast Ethernet port (FE)
- Gigabit Ethernet port (GE)
- Multigigabit Ethernet port (mGig)
- SFP module slot (SFP)
- SFP+ module slot (SFP/SFP+)





Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

Cisco Services

Programs & Promotions



# Wireless

## Wireless Access Points / Controllers



### Turbo Performance

Full Technical Comparison between Cisco and Aruba



Cisco 2800

Models support internal or external antennas



Aruba AP-335

Contains internal antennas

Cisco's AP can dynamically change its 2.4-GHz radio to be a 5-GHz radio	Only Cisco's dual-band Cisco Aironet AP can dynamically reconfigure its 2.4-GHz radio to be a 5-GHz radio and run both simultaneously, significantly increasing channels and 5-GHz device throughput.
Better throughput performance with Cisco	In a typical dual-band environment, with both 2.4- and 5-GHz radios operating, Cisco achieved over 1 Gbps of AP throughput. Aruba posted a max AP throughput of just 714 Mbps under the same conditions.
More clients can stream quality video with Cisco AP	The Cisco Aironet 2800 can successfully stream cleanly watchable 5-Mbps video to more clients than the Aruba AP-335 can.
Cisco's RRM out-performs Aruba's ARM in dynamic radio configuration	Cisco's Radio Resource Management (RRM) is better able to adapt to interference – both in detecting interference and reconfiguring radios to minimize it – than Aruba's Adaptive Radio Management (ARM)
Cisco AP's are managed as a unit, improving coverage	Cisco's Wireless LAN Controller manages all connected APs as a unit and can adjust power levels to maximize available frequencies.
Aruba MU-MIMO spatial-stream support offers no advantage over Cisco	Testing found the Aruba AP-335s claimed support for four spatial streams can actually reduce aggregate throughput, offering no advantages over the Cisco 2800 APs support of three spatial streams.

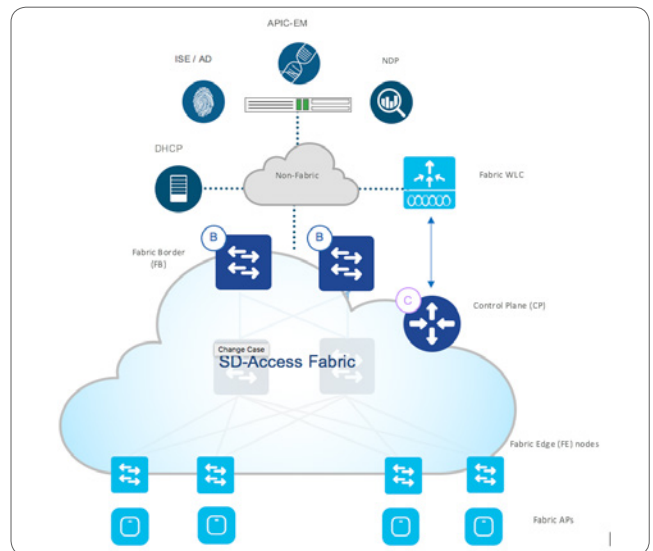


for more information, check the full Miercom report <http://cs.co/9002DE8du>

### Software Defined Access – Wireless

SD-Access Wireless and the integration of wireless with SD-Access Fabric brings:

- **Optimized Distributed Data Plane:** the data plane is distributed at the edge switches for optimal performance and scalability without the hassles usually associated with distributing traffic (spanning VLANs, subnetting, etc.)
- **Seamless L2 Roaming everywhere:** SD-Access Fabric allows clients to roam seamlessly across the campus while retaining the same IP address.
- **Simplified Guest and mobility tunneling:** an anchor WLC controller is not needed anymore and the guest traffic can directly go to the DMZ without hopping through a Foreign controller
- **IOT Ready Infrastructure:** IoT traffic can be easily segmented from your corporate traffic, end to end, across your network
- **Policy simplification:** SD Access breaks the dependencies between Policy and network constructs (IP address and VLANs) simplifying the way we can define and implement Policies. For both wired and wireless clients.
- **Segmentation made easy:** Segmentation is carried end to end in the Fabric and is hierarchical, based on Virtual Networks (VNs) and Scalable Group Tags (SGTs). Same segmentation policy is applied to both wired and wireless users
- **Simplified operations:** one subnet for AP onboarding, no need for client VLANs, ACLs, VLAN Pooling, Dynamic Interfaces. Client IP Subnetting is simplified and the SDA Fabric allows to have one subnet to be provisioned for clients across entire Campus



#### SD-Access Wireless Platform support :

The SD-Access Wireless Architecture is supported on the following Wireless LAN controllers with AireOS release 8.5 and higher:

- AIR-CT3504
- AIR-CT5520
- AIR-CT8510
- AIR-CT8540



AIR-CT3504



AIR-CT5520



AIR-CT8510



AIR-CT8540

Fabric-aware Wireless LAN controllers

This architecture is optimized for Wave2 11ac access points in Local mode:

- AP1815
- AP1830
- AP1850
- AP2800
- AP3800



AP1815



AP1830



AP1850



AP2800



AP3800

Wave2 11ac Access Point support







Wave 1 11ac access points are supported with SD-Access wireless with limited feature support

\*1 Cisco Aironet 1560 Series are to be supported in future software release.



## Flexible Radio Assignment

With Cisco's Aironet 2800 and 3800 Series Access Points, we support the latest Wi-Fi Standard **802.11ac Wave 2** providing more bandwidth for more devices. We go beyond the standard to provide advanced innovation that self-optimizes your network in those unpredicted times of high density. This feature is called **Flexible Radio Assignment**. It automatically detects when a high number of devices are connected to a network by using the dual radios in the access point to serve more clients, while still monitoring the network for security threats and RF Interference that may affect performance. **Flexible Radio Assignment** is a Cisco Innovation designed to provide a better mobile user experience for high density networks.

 5GHz Serving	 2.4GHz Serving	<ul style="list-style-type: none"> <li>• Default operating mode</li> <li>• Serve clients on both 2.4GHz and 5GHz</li> </ul>
 5GHz Serving	 5GHz Serving	<ul style="list-style-type: none"> <li>• Dual 5GHz support, both radios serving clients on 5GHz</li> <li>• Maximum over air data rate up to 5.2Gbps</li> </ul>
 5GHz Serving	 Wireless Security Monitor	<ul style="list-style-type: none"> <li>• Wireless security monitoring</li> <li>• Scan both 2.4GHz and 5GHz for security threats</li> <li>• Serve clients on 5GHz</li> </ul>

## Cisco Mobility Express Solution

The **Cisco Mobility Express Solution** is specifically designed to help small and medium-sized networks easily and cost-effectively deliver enterprise-class wireless access to employees and customers.

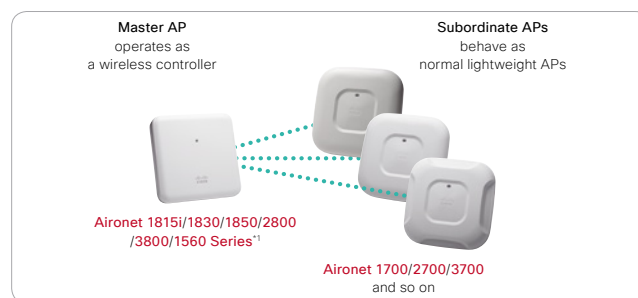
Cisco Mobility Express Solution is an on-premise, managed Wi-Fi solution that:

- Provides an easy, over-the-air interface for deployment in under **10 minutes**
- Is ideal for small and medium-sized deployments of up to **25/50/100 Access Points depending on the master access point**
- Is supported on **Cisco Aironet 1815/1830/1850/2800/3800/1560 Series<sup>1</sup>**
- Can control other access points, such as Cisco Aironet 1700/2700/3700 Series



3-step over-the-air wireless network configuration

In the Cisco Mobility Express Solution, one access point (AP), running the Cisco Mobility Express wireless controller, is designated as the **master AP**. Other access points, referred to as **subordinate APs**, associate to this master AP. The master AP operates as a **wireless controller**, to manage and control the subordinate APs, and also operates as an access point to serve clients. The subordinate APs behave as normal lightweight access points to serve clients.

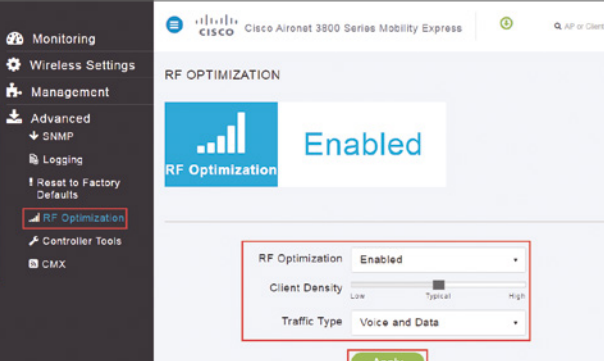


## Cisco Mobility Express Software for Cisco Wireless Release 8.4 & 8.5 NEW

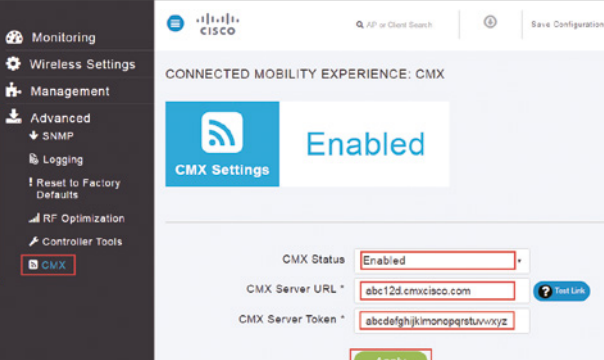
In the **Cisco Wireless Release 8.4**, the following new features and functionalities have been introduced to the Cisco Mobility Express Software:

- **Support the Cisco Aironet 1540:** available starting release 8.5
- **Support for centralized NAT configuration:** available starting release 8.5
- **Enhanced best practices with the following provisions in the GUI:** available starting release 8.5
  - Improved support for Apple devices through QoS Fastlane (for iOS application traffic prioritization)
  - Support for ISE RADIUS
  - Support for RF management through Flexible Radio Assignment (FRA)
- **Increased scale up to 100 APs and 2000 clients depending on the master AP:** available starting release 8.4
- **Automatic day 0 provisioning of the master AP through the Cisco Network Plug and Play (PnP) solution:** available starting release 8.4
- **Enable suggestions for enhancements via Make a wish in the GUI**
- **Application control through AVC:** available starting release 8.4
- **Additional control to advanced users through the Expert View in the GUI:** available starting release 8.4
- **WLAN enhancements in the GUI with provisions for the following:** available starting release 8.4
  - External web authentication for guest WLANs
  - MAC filtering
  - Hiding the WLAN SSID by disabling broadcast
  - Supporting 802.11k and 802.11v and adaptive 802.11r
  - Enabling or disabling client band select and load balancing
- **QoS Fastlane, for iOS application traffic (like voice or video) prioritization, configurable from the CLI:** available starting release 8.4
- **Ability to collect, bundle, and export the support bundle (logs, core, and crash files) for troubleshooting:** available starting release 8.4
- **Support for controlled access lobby ambassador account to create and manage guest user accounts:** available starting release 8.4

### RF Optimization in the Web User Interface



### CMX Settings in the Web User Interface



## IEEE 802.11ac

IEEE 802.11ac (11ac) is the successor of IEEE 802.11n (11n), which is the current mainstream wireless standard. It outperforms typical 1 GE wired LAN with a maximum throughput of 6.9 Gbps, compared against the theoretical maximum throughput of 600 Mbps of 11n. 11ac achieves higher communication speeds by strengthening the following three elements:

- Higher density modulation method: Increased from 64QAM to 256QAM (11n)
- Expansion of channel bonding: Increased from 40 MHz max. (11n) to 80 MHz max. (11ac Wave 1) or up to 160 MHz (11ac Wave 2)
- Further evolved MIMO (Multiple Input Multiple Output): Increased the maximum number of data streams in 11n from 4 to 8 and upgraded the simultaneous communication capability from 1:1 to 1:n (Multi-User MIMO)

Among Cisco's Access Points, the **Cisco Aironet 1700/1810/1810W/1830 Series**, the **Cisco Aironet 1560/1570/2700/3700 Series**, the **Cisco Aironet 1850 Series**, and the **Cisco Aironet 2800/3800 Series** are compatible with 11ac, delivering theoretical maximum throughputs of 867 Mbps, 1.3 Gbps, 1.7 Gbps and 2.6 Gbps, respectively.

### IEEE 802.11n/ac Specification Comparison

Standard/Number of Data Streams		Theoretical Maximum Throughput			
		20 MHz	40 MHz	80 MHz	160 MHz
IEEE 802.11n	1 stream	72 Mbps	150 Mbps	-	-
	2 streams	144 Mbps	300 Mbps	-	-
	3 streams	216 Mbps	450 Mbps	-	-
	4 streams	288 Mbps	600 Mbps	-	-
IEEE 802.11ac	1 stream	-	200 Mbps	433 Mbps	866 Mbps
	2 streams	-	400 Mbps	866 Mbps	1733 Mbps
	3 streams	-	600 Mbps	1299 Mbps	2600 Mbps
	4 streams	-	800 Mbps	1733 Mbps	3466 Mbps
	5 streams	-	1000 Mbps	2166 Mbps	4333 Mbps
	6 streams	-	1200 Mbps	2599 Mbps	5200 Mbps
	7 streams	-	1400 Mbps	3033 Mbps	6066 Mbps
	8 streams	-	1600 Mbps	3466 Mbps	6933 Mbps

## Cisco High Density Experience (HDX) Technology

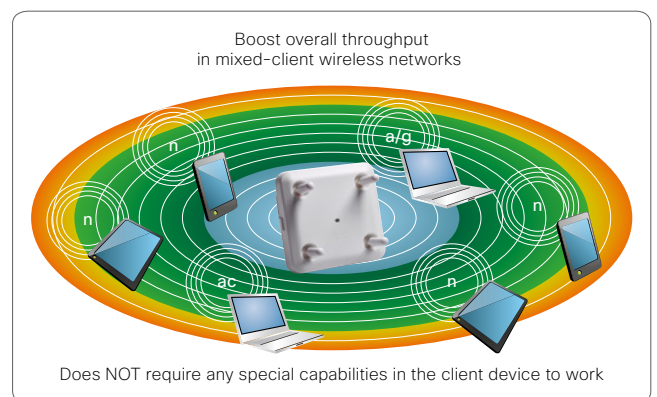
With the introduction of IEEE 802.11ac (11ac) technology, networks are only going to get more crowded. We have enhanced **Cisco High Density Experience (HDX)** suite of solutions, which automatically manages the airwaves and improves Wi-Fi performance. Available on the **Cisco Aironet 2700/2800/3700/3800 Series** Indoor Access Points and the **Cisco Aironet 1560/1570 Series** Outdoor Access Point, HDX is regularly updated with new features that alleviate high-density network strain and improve user experiences as 11ac and other trends load the airwaves with more traffic.

- **Flexible Radio Assignment & Dual 5-GHz<sup>1</sup>**: Allows the access points to intelligently determine the operating mode of serving radios based on the RF environment. The Dual 5-GHz mode enables both radios to operate in 5-GHz client serving mode, allowing an industry-leading **5.2 Gbps** (2 x 2.6 Gbps) over-the-air speed while increasing client capacity.
- **Turbo performance**: Dedicates CPU & RAM to each radio, allows access points to scale to 60 clients or more, with each client running media-rich video or interactive traffic, without any performance degradation.

- **Cisco ClientLink for 11ac**: Improves downlink performance to all mobile devices, including one-, two-, and three-spatial-stream devices on 11a/b/g/n/ac while improving battery life on mobile devices such as smartphones and tablets.
- **Cisco CleanAir for 11ac**: Enhanced with 80-, and 160-MHz channel support, provides proactive, high-speed spectrum intelligence to combat performance problems due to wireless interference.
- **Optimized Roaming**: Helps ensure that client devices associate with the access point in their coverage range that offers the fastest data rate available.
- **Dynamic Bandwidth Selection**: Automatically selects the optimal channel width for each radio. For example: If radar is detected on part, but not all, of the frequency, the access point can narrow the serving channel rather than moving entirely to a new frequency, enhancing spectrum efficiency.
- **Zero Impact AVC<sup>1</sup>**: Uses dedicated hardware acceleration to improve the performance of line-speed applications such as Cisco Application Visibility and Control (AVC).

## Cisco ClientLink for 11ac

In a mixed environment with low-speed clients (e.g. 11a/g clients) and high-speed clients (e.g. 11n/ac clients), the communication performance of the entire wireless LAN network will be dragged down by the slower clients. The **Cisco ClientLink** technology implemented on Cisco Aironet Access Points uses the signal processing expansion function, which is embedded in the chipset, to analyze the uplink communication signals from the client and strengthen/optimize the downlink communication signals to enhance the communication performance of low-speed clients. **Cisco ClientLink 3.0/4.0** implemented on the **Cisco Aironet 1560/1570/2700/2800/3700/3800 Series** use the third or fourth antenna of the access points to also enhance the communication performance of 11n/ac-compatible clients supporting up to three data streams, including the iPhone, iPad and latest laptops.



## Cisco CleanAir for 11ac

**Cisco CleanAir** is an innovative technology for the Controller-based Wireless Solution that enables construction of self-recovering, self-optimizing wireless LAN environments.

In conventional technologies, the network administrators were required to move around carrying a sensor-equipped laptop in order to identify the source of radio interference. In Cisco CleanAir, Cisco Aironet Access Points with built-in ASIC (a dedicated custom chip) serve the roles of a measuring instrument and an analyzer for the wireless environment; and the data obtained

from the Cisco Aironet Access Points are presented in a visualized manner. This enables network administrators to identify the cause of a problem and fix it promptly and efficiently. This technology also offers the wireless resource management function which alleviates problems by automatically optimizing the frequency band after detecting a radio interference.

**Cisco Aironet 1570/2700/3700 Series** support the 80 MHz channel bandwidth of 11ac Wave 1, and **Cisco Aironet 1560/2800/3800 Series** support the 160 MHz channel bandwidth of 11ac Wave 2.

<sup>1</sup>Cisco Aironet 2800/3800 Series only.

# Cisco Connected Mobile Experiences (CMX) Solutions

Cisco Connected Mobile Experiences (CMX) is a revolutionary solution that collects and analyzes the location of wireless LAN (Wi-Fi) devices such as smartphones and tablets for business utilization. This solution supports the monetization of wireless LAN in a wide range of sectors including retail, services, transportation, healthcare, education, and government offices.

There is some confusion around terminology between CMX and the Mobility Services Engine (MSE). The MSE refers to the location appliance (physical or virtual) and the name of the product prior to CMX 10. From version 10, however, we refer to CMX as the overall name of the product and platform. The term platform is important as CMX actually consists of a number of different products and capabilities. Cisco CMX provides the services described below.



## ■ Cisco CMX Detect & Locate

service enables you to view and track devices in your deployment.

The Detect & Locate service uses the data provided by Cisco WLCs to calculate the X,Y location (based the floor map uploaded) of wireless devices that are detected by the access points that support the wireless LAN (WLAN) to a high degree of precision.

## ■ Offering a Variety of Analysis Methods including Traffic Line Information and Residence Time



## Cisco CMX Analytics

provides a set of data analytic tools for analyzing Wi-Fi device locations. The Analytics service helps organizations use the network as a data source to view visitors' behavior patterns and trends, which will in turn help businesses improve visitor experience and boost customer service.

- Device count
- Dwell time
- Dwell time breakdown
- Associated User Report
- Path analysis
- Correlation



## ■ Venue Efficiency

By helping you better understand how your visitors actually behave while at your site, Cisco CMX helps you make the best use of your floor plan. With this improved insight, you can:

- Determine the most trafficked locations to position advertisements, products or services
- Adjust venue layout to optimize traffic flow in periods of high use
- Staff service locations to accommodate visitor flows and time of day
- Evaluate impact of floor plan adjustments
- Office/building/store space utilization (e.g., great for helping an enterprise figure out how its workforce is using office space, and optimizing that usage)

For our customers and your business, the Cisco CMX solution can deliver the right information at the right time.

## Cisco Mobility Services Engine (MSE)

Cisco Mobility Services Engine (MSE) contains functionality not present in CMX. Specifically, Cisco Adaptive Wireless Intrusion Prevention System (aWIPS). As a reminder, WIPS is used to detect, locate, mitigate, and contain wireless rogues and threats at Layers 1 through 3.

The role of the MSE with WIPS is to provide the location of the alarm and de-duplication of Alarms sent to Prime. Standard WIPS functionality (characterizing attacks) is done on the Access Point and sent to the WLC. With aWIPS, however, attacks that are simultaneously heard on several Access Points are correlated on the MSE 8.0 WIPS feature. MSE and Adaptive wIPS software licenses are required to detect over-the-air threats such as reconnaissance, encryption cracking, authentication cracking, denial-of-service (DoS) attacks, and potential threats indicated by anomalous traffic patterns. MSE and Adaptive wIPS also provide full-forensics traffic captures, long-term security event archiving, and reporting, wIPS default tuning profiles, and a threat knowledgebase with plain-English attack descriptions and response guidance for ease of operations.

Currently, CMX does not support WIPS, but 10.4 will provide locating of rogue APs and rogue clients.



SKU	Description	Managed Access Points	
		Location service CMX	wIPS Monitor Mode wIPS Enhanced Local Mode
L-MSE-7.0-K9	Software product	5,000	10,000
AIR-MSE-3365-K9	Hardware appliance	10,000	10,000

## ■ Cisco CMX Base License

SKU	Supported Access Points
MSE 8.0 <sup>*1</sup>	
L-LS-1AP	1
L-LS-100AP	100
L-LS-1000AP	1,000

## ■ Cisco CMX Advanced License

SKU	Supported Access Points
MSE 8.0 <sup>*1</sup>	
L-AD-LS-1AP	1
L-AD-LS-100AP	100
L-AD-LS-1000AP	1,000
L-UPG-LS-1AP	1

\*1 AIR-CMX-CLOUD is required.

- Switches
- Wireless
- Routing
- Security
- Cisco Meraki
- DNA-Center
- SMB
- Software
- Financing
- Cisco Services
- Programs & Promotions

## Cisco CMX Connect & Engage

CMX Connect has been expanded to include a new value-add component called Engage. We have Connect which provides intuitive, simple, highly customizable, and location-aware guest services in the form of a captive portal that offers multiple types of guest on-boarding experiences:

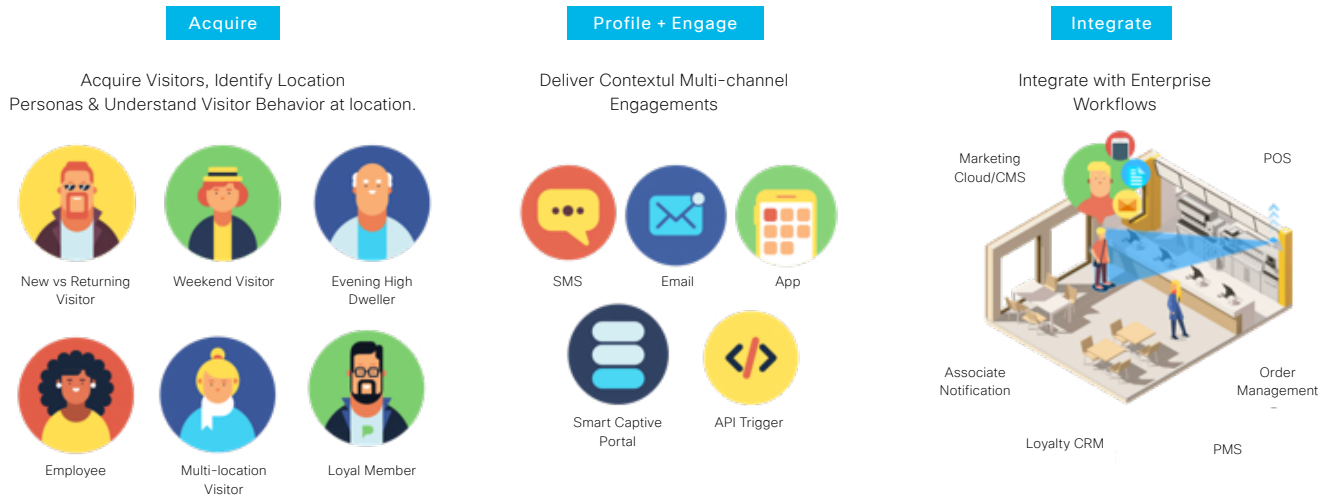
- Registration Form
- Social or Registration Login
- Customized Portal (Engage)
- Social Login
- SMS Form
- PMS Auth Form

Engaging with guests opens a direct channel of communication that lets businesses better understand and deliver what your guests want. With CMX Connect & Engage you can:

- Increase loyalty of existing customers and attract new customers by providing them with a personalized experience
- Heighten the guest experience by providing wireless access and key information during their journey
- Increase visitor satisfaction by helping them make decisions more aligned with their needs

MX Engage builds upon this capability to provide captivating mobile experiences and deliver valuable location based insights.

- Create rich, dynamic captive portals that can function as web-applications
- Identify and acquire customers.
- Discover new insights.
- Deliver personalized engagement-across all your locations.
- Integrate with back-office systems such as loyalty and Customer Relationship Management (CRM).
- Meraki and Cisco on-premise (Aironet) wireless integration.



Engage is available as a Cloud Service and has a separate licensing model based on the number of Access Points.

### ■ Cisco CMX Cloud

Cisco CMX Cloud revolutionizes the delivery of wireless guest access and in-venue analytics, integrating seamlessly with Cisco wireless infrastructure. This cloud-delivered Software-as-a-Service (SaaS) offering is quick to deploy and intuitive to use. The affordable subscription-billing model helps reduce initial investments in equipment (capital expenditures [CapEx]) and IT resources. Ultimately, this solution accelerates how wireless infrastructure can deliver business outcomes by:

- Detecting all Wi-Fi devices (the “devices”) in the venue and providing analytics on their presence, including dwell times, new vs. repeat visitors, and peak times
- Providing an easy-to-use guest-access solution for visitors through a custom portal using various authentication methods including social, self-registration, and Short Message Service (SMS)
- Engaging visitors directly on the guest portal page or mobile app with location-based content
- Sign up for a Free 60 days trial → [cmxcloud.cisco.com/](http://cmxcloud.cisco.com/)

### ■ Cisco Connected Mobile Experiences Cloud

SKU	Description	SKU	Description
AIR-CMX-SVC-CX <sup>1</sup>	CMX Cloud Connect.	AIR-CMX-SVC-CPAX <sup>1</sup>	CMX Cloud Connect with Presence Analytics.



## CMX Cloud

CMX Cloud continues to benefit from new features, automatically available by virtue of the Cloud model. Examples of these include:

- **Sponsor portal**
  - Visitor Temporary accounts
  - Guest Account details
  - Email Verification: Host sponsor or Email Sponsor
- **CMX Cloud Connect Vouchers** - authentication path
  - Up to 100 unique voucher keys
  - One time used

- **CMX Connect Custom Policy**
  - Limit guest access
  - Customize policy plans with Bandwidth and Timed access limit (to splash page, access duration)
  - Globally or Site level
- **Social Media**
  - Twitter and LinkedIn
- **Meraki integration**
- **Per site customization**
- **RADIUS server (External Web Authentication)**






Note that the above features are not available with the on-premise version of CMX Connect.

Another important update is that CMX Cloud is now available within the Cisco ONE license model as Cisco ONE Mobility Cloud Services. This bundles together CMX Cloud Connect with Presence Analytics and Umbrella (openDNS) WLAN.

### CMX Cloud

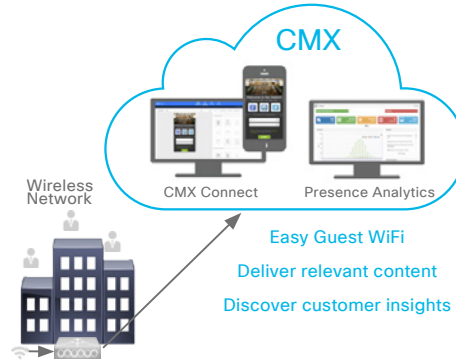
CMX 10 as a cloud-delivered SaaS offer

-  Simple and frictionless ordering, deployment and management
-  Shift from upfront CapEx to an affordable OpEx model
-  Seamless scalability of innovative mobility services

The Cisco Umbrella WLAN provides a cloud-delivered network security service at the Domain Name System (DNS) level, with automatic detection of both known and emergent threats.

Cisco ONE Mobility Cloud Services is found using the C1-AIR-MOBILITY Single SKU with two license tiers options.

- C1-AIR-MOB: Billing SKU for Cisco Mobility Cloud Services
- C1-UMB-WLAN: \$0 SKU for Umbrella WLAN
- C1-AIR-CMX-CPAX: \$0 SKU for CMX Cloud



Sign up for 60 day free trial at [cmxcloud.cisco.com](http://cmxcloud.cisco.com)

## CMX Solutions

Often, a third party is required to support the customer use case. Cisco has partnered with several companies to provide specialized solutions in the following areas:

### Workplace Analytics with *rifiniti*

This is a cloud, SaaS based solution that provides real estate and facility teams with analytical data on how their space is being used. It has the potential to save customers money through cost avoidance or refactoring space for different purposes.

This solution is aimed at the corporate office “carpeted” areas and uses Cisco CMX as one of the primary data sources.

It is available on several price lists. More details can be found here: <http://cs.co/9006DE21K>



### Mobile Applications with *phunware*

*phunware* delivers exceptional mobile experiences across a range of verticals. The complete solution can be purchased from Cisco and developed by *phunware*, or an SDK can be acquired to allow the end customer to create their own Application.

A main feature is the “blue dot” navigation which delivers GPS like functionality indoors using Cisco CMX technology.

More details can be found here: [www.phunware.com/platform/blue-dot/](http://www.phunware.com/platform/blue-dot/) and by contacting the Mobility team.

Note that certain opportunities may qualify for a free Proof Of Concept (PoV). Contact the Mobility team for details.



### Asset Management with *Airista*

Asset management is concerned with locating and tracking physical objects/items using the wireless network. This is typically done by attaching a wifi “tag” to the object which is then located using CMX. The main markets for this capability are Healthcare, Industrial and Retail.

Deployments tend to be very specialized and require integration with customer back-office systems, hence Cisco has partnered with Airista to provide the hardware tags, software integration and services. These SKUs are on several price lists.

This capability can also be extended to use Bluetooth Low Energy (BLE) to reduce costs and meet specific use cases such as in-room detection.

For more details, contact the Mobility or IoT teams.





## The next generation of location accuracy is here

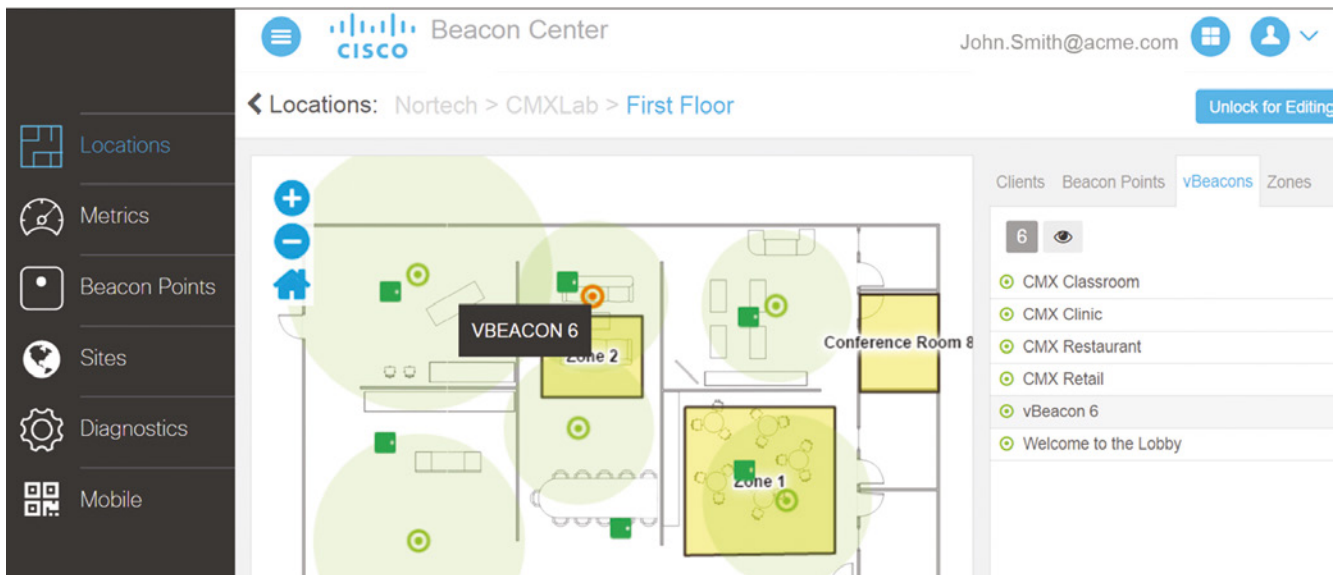
Cisco has developed a unique and highly innovative solution to the problem by combining sophisticated cloud-based software (Cisco® Connected Mobile Experiences (CMX) Cloud Beacon Center), on-premises 16-element steerable BLE antenna array (Cisco Beacon Point) and mobile software development kit (SDK) software for iOS and Android devices.

Cisco's Virtual BLE Beacon solution delivers high-accuracy location using Cisco Beacon Point hardware and CMX Cloud Beacon Center management. Generate eight virtual beacons from a single Beacon Point. It's as easy as dropping a pin on a map. Get true blue-dot experience for navigation plus proximity marketing, all at your fingertips.

## What's inside the Virtual BLE Beacon Solution

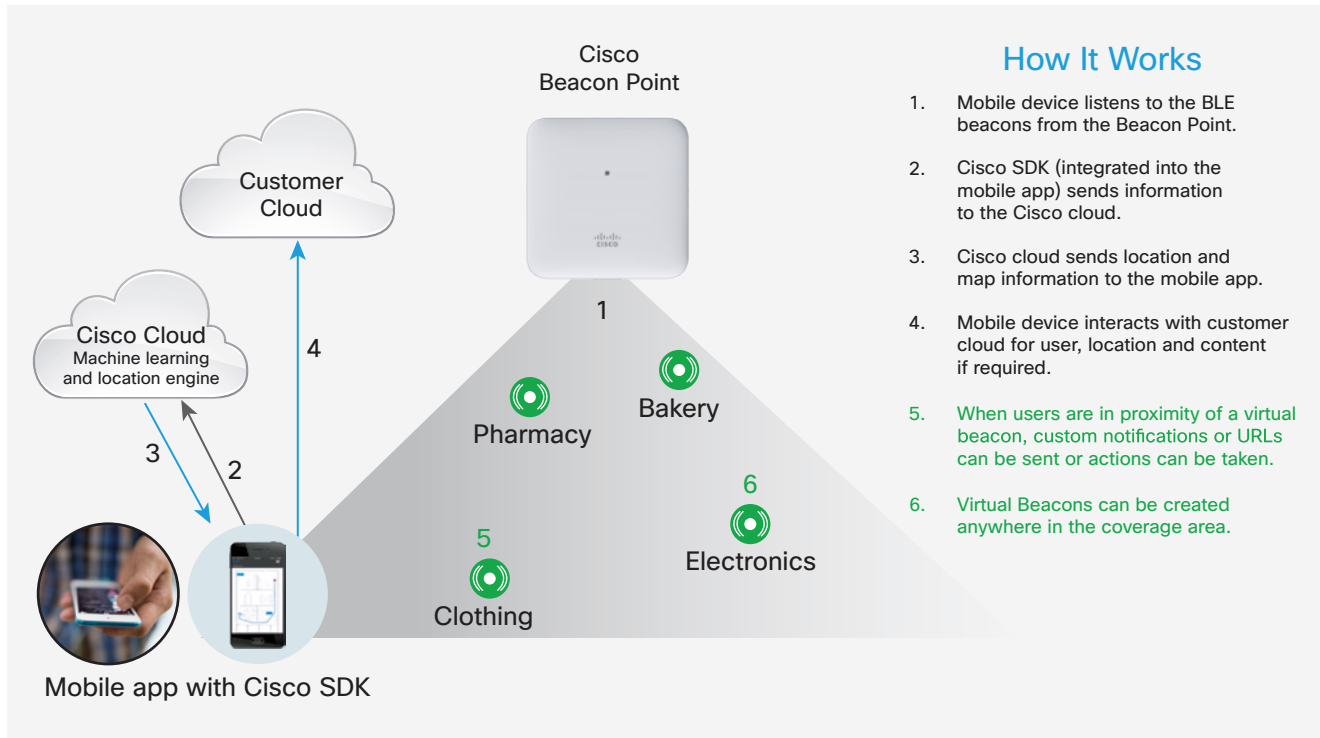


Cisco Beacon Point is an industry-first virtual BLE array with 16 steerable antenna elements that can create eight virtual beacons. IT teams can deploy beacon points in their venues to achieve desired coverage, with each beacon point covering 2500 square feet of area and mounted at heights up to 13-15 feet. Unlike traditional physical beacon, Beacon points have IP addresses and can be easily managed by network IT teams. Beacon points are powered over standard Power over Ethernet (PoE; 802.3af or 802.3at) and connect over the Internet to the CMX Cloud Beacon Center.



CMX Cloud Beacon Center is subscription software delivered via the cloud. The Beacon Center application, shown in Figure 2, offers a way to create virtual beacons anywhere in the coverage area by a simple click, drag, and drop operation from the user interface. Administrators can create proximity messages or use the built-in zone and path editor for analytics and wayfinding. Marketers can deliver real-time, location-aware, personalized content to increase customer engagement and measure the effectiveness of marketing campaigns. Businesses can now focus on outcomes while reducing the footprint of on-premises servers and battery-operated devices. Provisioning and deployment are quick and easy via the cloud. The Cisco Virtual Beacon SDK supports iOS and Android mobile devices.

# Cisco Virtual Beacon - How it works



## System Requirements

CMX Cloud Beacon Center	CMX Cloud Beacon Center manages Cisco Beacon Points and allows the creation of virtual beacons
Cisco Beacon Point	Cisco Beacon Point transmits directional BLE beams to enable virtual beacons
Cisco Virtual Beacon SDK enabled mobile app	Cisco Virtual Beacon SDK detects BLE beams and interacts with the cloud. The SDK is a required component and should be integrated into any branded app developed for proximity engagement or way finding. SDK is available for the last two major versions of iOS and Android.

## Summary

Cisco virtual beacon technology introduces Cisco CMX Cloud Beacon Center and Cisco Beacon Points to:

- Deliver wayfinding and proximity engagement use cases
- Experience highly accurate location finding
- Replace battery-operated beacons with virtual beacons
- Eliminate expensive RF calibrations
- Deliver operational simplicity for a scalable BLE beacon solution for your enterprise

## Beacon Point Module

Cisco has also released a Module version of Beacon Point, designed to fit into and onto the 3802 Access Point shown below:

Having the Beacon Point Module on the access point enables the deployment of virtual BLE technology while reducing:



- The number of boxes on the ceiling by half
- The number of unit installations by half
- The Ethernet cables pulls by half
- The number of ports used on the Ethernet switch by half

The combination of the Beacon Point and the Beacon Point Module give users more tools in their virtual beacon deployment toolbox. Organizations can deploy the Beacon Point Module at the locations where the Aironet 3800 Series is used and mix and match with the standalone Beacon Point to address their Wi-Fi, wayfinding, and proximity engagement use cases most economically and as they see fit.

The SKU for the Cisco Beacon Point Module is AIR-RM-VBLE2-K9=

- Switches
- Wireless
- Routing
- Security
- Cisco Meraki
- DNA-Center
- SMB
- Software
- Financing
- Cisco Services
- Programs & Promotions

## Wireless Product Line

### Cisco Aironet Access Points

#### ■ Indoor Access Points

All indoor models of the **Cisco Aironet Access Points** are compatible with the IEEE 802.11 standards including IEEE 802.11a/b/g/n and the latest standard IEEE 802.11ac which provides throughput up to 2.6 Gbps (some models are IEEE 802.11ac-compatible). A wide lineup of models are available including: (1) Lightweight compact models featuring a streamlined body with built-in antenna and integrated LAN/power cable using PoE (Power over Ethernet) for stylish installation without spoiling the aesthetics of the office; (2) Heavy-duty models with a wide selection of external antennas and featuring a rigid metal chassis to support a wide range of operating temperatures for use in factories, warehouses and stores where environmental requirements are strict; and (3) High-performance models for telecommuters and satellite offices offering the same level of security and network services as the headquarters office.

➔ See page 57 to 58 for details.



#### ■ Outdoor Access Points

The outdoor models of the **Cisco Aironet Access Points** deliver high-speed and stable wireless LAN environments in various locations such as in a massive city-size area, inside a company building, a factory ground, or a mining field. Featuring a chassis with IEC IP67 waterproof and NEMA Type 4X certified outdoor dust/rust resistance, a wide lineup of outdoor models is available to meet the diversifying customer needs in the harshest of environments. Available models include the lightweight compact model with a polished exterior design that blends into the surrounding environment, the PoE power supplying model capable of powering surveillance cameras, and the model with built-in cable modem for utilizing the existing cable network.

➔ See page 59 for details.



### Cisco Wireless Controllers

**Cisco Wireless Controller** is a platform that enables centralized management of multiple Cisco Aironet Access Points including remote bases. This platform automates the configuration management required for deploying/adding Cisco Aironet Access Points to reduce the workload of the network administrator, as well as provide the control functions needed to establish a stable wireless LAN environment. The control functions include load balancing of Cisco Aironet Access Points and prompt and dynamic response to changes in the wireless environment.

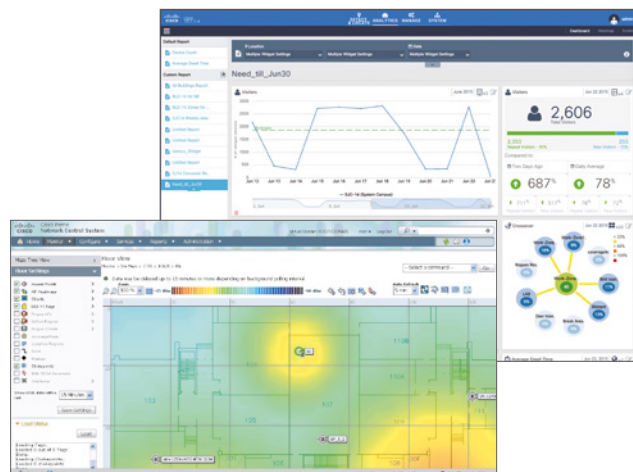
➔ See page 62 for details.



### Mobility Services & Network Management Tools











**Cisco Mobility Services Engine (MSE)**, which delivers a wide range of mobility services such as collecting the location of mobile devices, and **Cisco Prime Infrastructure**, that is designed to dramatically simplify network operations by providing management of wired and wireless network seamlessly, these are two critical components of **Cisco CleanAir**.

➔ See page 51 for details.



# Cisco Aironet Access Points

## Indoor Access Points

2.6 Gbps		 HDX	 HDX mGig
1.7 Gbps			
1.3 Gbps	 HDX	 HDX	
867 Mbps			
			
<b>11ac Wave 1</b>		<b>11ac Wave 2</b>	

### ■ Cisco Aironet Indoor Access Points

All models of **Cisco Aironet Indoor Access Points** are compatible with the IEEE 802.11n standard; and some models are also compatible with IEEE 802.11ac delivering high-speed and stable wireless LAN environments with a theoretical maximum throughput of between 300 Mbps and 2.6 Gbps. A broad selection of models is available for various installation environments and network requirements.

- Built-in antenna model: These models feature a streamlined body and an integrated LAN/power cable using PoE (Power over Ethernet) for a stylish installation that blends into the office environment.
- External antenna model: These models feature a rigid metal chassis and support a wide range of operating temperatures for use in factories, warehouses and stores where environmental requirements are very strict. A wide selection of antennas are available for these models to suit different installation environments (Refer to page 37-38 for details on the **Cisco Aironet Antennas**).

There are two types of models for Cisco Aironet Indoor Access Points: **Standalone** (or **Mobility Express**) and **Controller-based** models. The Controller-based models are designed to operate in linkage with the **Cisco Wireless Controller**.

### ■ Highlights

- IEEE 802.11n-compatible (All models)
- IEEE 802.11ac Wave 1-compatible (**Cisco Aironet 1700/2700/3700 Series**)
- IEEE 802.11ac Wave 2-compatible (**Cisco Aironet 1815i/1815t/1815w/1830/1850/2800/3800 Series**)
- Supports 2.4 GHz/5 GHz dual-band (All models)
- Supports **Cisco CleanAir Express** (Controller-based models of the **Cisco Aironet 1700 Series**)
- Supports **Cisco CleanAir** (Controller-based models of **Cisco Aironet 2700/2800/3700/3800 Series**, refer to page 31 for details on the technology)
- Supports **Cisco OfficeExtend** (Controller-based models, excluding some models)
- Supports **Cisco ClientLink** (excluding some models, refer to page 31 for details on the technology)
- Supports **Cisco BandSelect** (Controller-based models, excluding some models)
- All 802.11ac wave 2 access points support Mobility express

For details on **Cisco Aironet Indoor Access Points**, visit the following Web site:

 [www.cisco.com/go/ap](http://www.cisco.com/go/ap)

## Cisco Aironet Access Points Transition Guide

### ■ Cisco Aironet Indoor Access Points

11n	11ac Wave 1	11ac Wave 2
Cisco Aironet 600 Series OfficeExtend	-	Cisco Aironet 1815t Series OfficeExtend
Cisco Aironet 700 Series	-	Cisco Aironet 1815i Series
Cisco Aironet 700W Series	-	Cisco Aironet 1815w Series
Cisco Aironet 1040 Series Cisco Aironet 1600 Series	Cisco Aironet 1700 Series	Cisco Aironet 1850 Series
Cisco Aironet 1140 Series Cisco Aironet 1250 Series Cisco Aironet 1260 Series Cisco Aironet 2600 Series	Cisco Aironet 2700 Series	Cisco Aironet 2800 Series
Cisco Aironet 3500 Series Cisco Aironet 3600 Series	Cisco Aironet 3700 Series	Cisco Aironet 3800 Series

\*1 Cisco Aironet 3600/3700 Series are planned to support 11ac Wave 2 via addition of a module.

Cisco Aironet 1815i Series <sup>NEW</sup>

Dimensions (Height x Width x Depth): 3.30 x 15.24 x 15.24 cm Weight: 0.40 kg

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP1815I-x-K9C	●	- <sup>9</sup>	-	-	-	●	●	●	1	-	●	●	Built-in
AIR-AP1815I-x-K9	- <sup>8</sup>	●	-	-	-	●	●	●	1	-	●	●	Built-in

Cisco Aironet 1815t Series <sup>NEW</sup> (Coming Soon)

Dimensions (Height x Width x Depth): 3.81 x 15.24 x 10.16 cm Weight: 0.37 kg

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP1815T-x-K9	-	●	-	-	-	●	●	●	4 <sup>5</sup> / <sub>6</sub>	-	●	●	Built-in

Cisco Aironet 1815w Series <sup>NEW</sup>

Dimensions (Height x Width x Depth): 3.18 x 8.89 x 13.97 cm Weight: 0.28 kg

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP1815W-x-K9C	●	- <sup>9</sup>	-	-	-	●	●	●	4 <sup>5</sup> / <sub>6</sub>	-	● <sup>7</sup>	●	Built-in
AIR-AP1815W-x-K9	- <sup>8</sup>	●	-	-	-	●	●	●	4 <sup>5</sup> / <sub>6</sub>	-	● <sup>7</sup>	●	Built-in

## Cisco Aironet 1830 Series

Dimensions (Height x Width x Depth): 5.08 x 21.08 x 21.08 cm Weight: 1.42 kg

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP1832I-x-K9C	● <sup>8</sup>	-	-	-	-	●	●	●	1	-	● <sup>7</sup>	●	Built-in
AIR-AP1832I-x-K9	- <sup>3</sup>	●	-	-	-	●	●	●	1	-	● <sup>7</sup>	●	Built-in

## Cisco Aironet 1850 Series

Dimensions (Height x Width x Depth): 5.08 x 21.08 x 21.08 cm Weight: 1.42 kg

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP1852I-x-K9C	● <sup>8</sup>	-	-	-	-	●	●	●	2 <sup>6</sup>	-	● <sup>7</sup>	●	Built-in
AIR-AP1852E-x-K9C	● <sup>8</sup>	-	-	-	-	●	●	●	2 <sup>6</sup>	-	● <sup>7</sup>	●	External
AIR-AP1852I-x-K9	- <sup>3</sup>	●	-	-	-	●	●	●	2 <sup>6</sup>	-	● <sup>7</sup>	●	Built-in
AIR-AP1852E-x-K9	- <sup>3</sup>	●	-	-	-	●	●	●	2 <sup>6</sup>	-	● <sup>7</sup>	●	External

## Cisco Aironet 2700 Series

Dimensions (Height x Width x Depth): 5.05 x 22.07 x 22.07 cm Weight: 1.00 kg

SKU	Stand alone	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-CAP2702I-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	2 <sup>6</sup>	-	● <sup>7</sup>	●	Built-in
AIR-CAP2702E-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	2 <sup>6</sup>	-	● <sup>7</sup>	●	External

## Cisco Aironet 2800 Series

Dimensions (Height x Width x Depth): 5.51 x 22.00 x 22.05 cm Weight: 1.60 kg<sup>9</sup>

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP2802I-x-K9C	● <sup>8</sup>	-	●	●	●	●	●	●	2 <sup>6</sup>	-	-	●	Built-in
AIR-AP2802E-x-K9C	● <sup>8</sup>	-	●	●	●	●	●	●	2 <sup>6</sup>	-	-	●	External
AIR-AP2802I-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	2 <sup>6</sup>	-	-	●	Built-in
AIR-AP2802E-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	2 <sup>6</sup>	-	-	●	External

## Cisco Aironet 3700 Series

Dimensions (Height x Width x Depth): 5.36 x 22.10 x 22.10 cm Weight: 1.13 kg

SKU	Stand alone	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-CAP3702I-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	1	-	● <sup>7</sup>	●	Built-in
AIR-CAP3702E-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	1	-	● <sup>7</sup>	●	External
AIR-CAP3702P-x-K9	- <sup>3</sup>	●	●	-	●	●	●	●	1	-	● <sup>7</sup>	●	External

## Cisco Aironet 3800 Series

Dimensions (Height x Width x Depth): 6.25 x 22.00 x 22.05 cm Weight: 2.00 kg<sup>10</sup>

SKU	ME Master	Controller based	Clean Air	Office Extend	Client Link	Band Select	IEEE 802		Ports		PoE (PD) <sup>1</sup>		Antenna
							11n	11ac	GE	mGig	802.3af	802.3at	
AIR-AP3802I-x-K9C	● <sup>8</sup>	-	●	●	●	●	●	●	1	1	-	●	Built-in
AIR-AP3802E-x-K9C	● <sup>8</sup>	-	●	●	●	●	●	●	1	1	-	●	External
AIR-AP3802P-x-K9C	● <sup>8</sup>	-	●	●	●	●	●	●	1	1	-	●	External
AIR-AP3802I-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	1	1	-	●	Built-in
AIR-AP3802E-x-K9	- <sup>3</sup>	●	●	●	●	●	●	●	1	1	-	●	External
AIR-AP3802P-x-K9	- <sup>3</sup>	●	●	-	●	●	●	●	1	1	-	●	External

## Cisco Hyperlocation Solution for the Cisco Aironet 3700 Series

SKU	Description
AIR-RM3010L-x-K9=	Hyperlocation Module with Advance Security.
AIR-ANT-LOC-01=	Hyperlocation Antenna, Model 1, Attached Omni.

\*1 The Cisco Aironet Power Supply Option is required when not using PoE receiving (Refer to page 38 for details). \*2 A dedicated WAN port is included.

\*3 Migration to the standalone model is supported via software. \*4 PoE power supplying GE x 1 is included. \*5 Cisco CleanAir Express is supported in Cisco AireOS 8.0 or higher.

\*6 AUX x 1 is included. \*7 Some features are disabled when powered via PoE (see datasheet). \*8 Supported in Cisco Mobility Express software.

\*9 Aironet 2802E - Dimensions (Height x Width x Depth): 6.35 x 22.00 x 22.28 cm, Weight: 2.10 kgD

\*10 Aironet 3802E and 3802P - Dimensions (Height x Width x Depth): 6.65 x 22.00 x 22.05 cm, Weight: 2.10 kgD

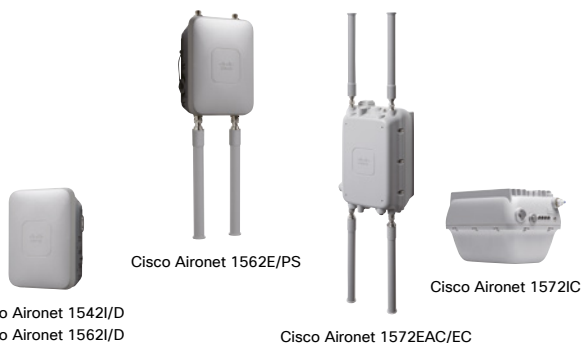


# Outdoor Access Points

## ■ Cisco Aironet Outdoor Access Points

The **Cisco Aironet Outdoor Access Points** deliver high-speed and stable wireless LAN environments in various locations such as in a massive city-size area, inside a company building, a factory ground, or a mining field. Featuring a chassis with IEC IP67 waterproof and NEMA Type 4X certified outdoor dust/rust resistance, a wide lineup of outdoor models is available to meet the diversifying customer needs in the harshest of environments.

- Built-in antenna models: **Cisco Aironet 1542I/D**, **Cisco Aironet 1562I/D**, and **Cisco Aironet 1572IC** have a polished exterior design that blends into the surrounding environment.
- External antenna models: A wide selection of antennas are available for **Cisco Aironet 1562E/PS**, and **Cisco Aironet 1572EAC/EC** to suit different installation environments (Refer to page 37-38 for details on the **Cisco Aironet Antennas**).
- Built-in cable modem models: **Cisco Aironet 1572IC/EC** incorporate a cable modem that is compatible with DOCSIS 3.0 (24x8), an international standard for communication services via coaxial cables used for cable television, etc.



## ■ Highlights

- IEC IP67 waterproof (All models)
- NEMA Type 4X certified outdoor dust/rust resistance (All models)
- Designed for harsh outdoor environments (All models)
- Supports built-in SFP module slot (**Cisco Aironet 1560/1570 Series**)
- Supports GPS (**Cisco Aironet 1570 Series**)<sup>\*1</sup>
- IEEE 802.11n compatible (All models)
- IEEE 802.11ac Wave 1-compatible (**Cisco Aironet 1570 Series**)
- IEEE 802.11ac Wave 2-compatible (**Cisco Aironet 1560/1540 Series**)
- Supports 2.4 GHz/5 GHz dual-band (All models)
- Supports 4.9-GHz public safety band (**Cisco Aironet 1562PS**)
- Supports **Cisco CleanAir** (**Cisco Aironet 1560/1570 Series**, Refer to page X for details on the technology)
- Supports **ClientLink** (**Cisco Aironet 1560/1570 Series**, Refer to page 31 for details on the technology)
- Supports **Cisco BandSelect** (All models)
- Supports **Cisco High Density Experience (HDX)** (**Cisco Aironet 1560/1570 Series**)

Model Name	Dimensions (Height x Width x Depth)	Maximum Weight
Cisco Aironet 1542I	20.00 x 15.00 x 6.10 cm	1.25 kg
Cisco Aironet 1542D	20.00 x 15.00 x 6.10 cm	1.25 kg
Cisco Aironet 1562I	22.86 x 17.27 x 9.90 cm	2.54 kg
Cisco Aironet 1562E	22.86 x 17.27 x 9.90 cm	2.54 kg
Cisco Aironet 1562D	22.86 x 17.27 x 10.92 cm	2.59 kg
Cisco Aironet 1562PS	22.86 x 17.27 x 9.90 cm	2.54 kg
Cisco Aironet 1572IC	29.97 x 20.07 x 20.07 cm	5.22 kg
Cisco Aironet 1572EAC	29.97 x 20.07 x 16.00 cm	6.12 kg
Cisco Aironet 1572EC	29.97 x 20.07 x 16.00 cm	6.12 kg

## ■ Cisco Aironet 1530 Series

SKU	Clean Air	Client Link	Band Select	Ports			Power Supply Options						Antennas				
				GE	SFP	Cable	AC	DC	PoE (PSE)	PoE+ (PD)	UPOE (PD)	PoC (PD)	Built-in Omnidirectional	Built-in Directional	External Dual-band	External Single-band	
AIR-CAP1532I-x-K9	-	-	●	2	-	-	-	●	-	-	●	-	-	3	-	-	-
AIR-CAP1532E-x-K9	-	-	●	2	-	-	-	●	-	-	●	-	-	-	-	2	2 + 2

## ■ Cisco Aironet 1560 Series

SKU	Clean Air	Client Link	Band Select	Ports			Power Supply Options						Antennas				
				GE	SFP	Cable	AC	DC	PoE (PSE)	PoE+ (PD)	UPOE (PD)	PoC (PD)	Built-in Omnidirectional	Built-in Directional	External Dual-band	External Single-band	
AIR-AP1562I-x-K9	●	●	●	1	1	-	-	●	-	-	●	-	3	-	-	-	-
AIR-AP1562E-x-K9	●	●	●	1	1	-	-	●	-	-	●	-	-	-	-	2	2 + 2
AIR-AP1562D-x-K9	●	●	●	1	1	-	-	●	-	-	●	-	-	2	-	-	-
AIR-AP1562PS-x-K9	●	●	●	1	1	-	-	●	-	-	●	-	-	-	-	2	2 + 2

## ■ Cisco Aironet 1570 Series

SKU	Clean Air	Client Link	Band Select	Ports			Power Supply Options						Antennas				
				GE	SFP	Cable	AC	DC	PoE (PSE)	PoE+ (PD)	UPOE (PD)	PoC (PD)	Built-in Omnidirectional	Built-in Directional	External Dual-band	External Single-band	
AIR-AP1572IC-x-K9	●	●	●	2	1	1	-	●	-	-	-	●	4	-	-	-	-
AIR-AP1572EAC-x-K9	●	●	●	2	1	-	●	●	● <sup>*4</sup>	-	●	-	-	-	-	4	2 + 2
AIR-AP1572EC-x-K9	●	●	●	2	1	1	-	●	-	-	-	●	-	-	4	2 + 2	

\*1 GPS Antenna (AIR-ANT-GPS-1) is required. \*2 2.4 GHz: 3 Tx / 3 Rx Antennas with 3 streams. 5 GHz: 2 Tx / 3 Rx Antennas with 2 streams. \*3 If "n" is "1", Duplex Filter split of: 5-42/88-1000 MHz. If "n" is "2", Duplex Filter split of: 5-85/108-1002 MHz. If "n" is "3", Duplex Filter split of: 5-65/108-1002 MHz. \*4 PoE+ power supply is supported.

Cisco® Aironet® 1540 Series outdoor access points offer the latest 802.11ac Wave 2 functions in a rugged, ultra-low-profile housing that service providers and enterprises can deploy easily.

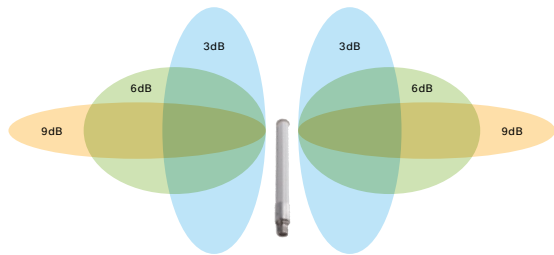
The Cisco Aironet 1540 Series is ideal for applications requiring rugged outdoor Wi-Fi coverage and supports the latest 802.11ac Wave 2 radio standard. Housed in a compact, aesthetically pleasing, easy-to-deploy package, the 1540 Series offers flexible deployment options for service providers and enterprise networks that need the fastest links possible for mobile outdoor clients (smartphones, tablets, and laptops) and wireless backhaul. The 1540 Series access points give network operators the flexibility to balance their desired wireless coverage with their need for easy deployment.

Whether deployed as a traditional access point or a wireless mesh access point, the 1540 Series provides the throughput capacity needed for today's bandwidth-hungry devices.






\*1 Customers are responsible for verifying approval for use in their individual countries. To verify approval that corresponds to a particular country, or the regulatory domain used in a specific country, see [www.cisco.com/go/aironet/compliance](http://www.cisco.com/go/aironet/compliance). Not all models available for all regulatory domains. Not all regulatory domains have been approved. As they are approved, the SKU will be available on the Global Price List.

# Cisco Aironet Antennas and Accessories






## Types of Available Antennas and Typical Uses

Antenna Type	Description	Recommended Deployment(s)
 Omnidirectional	Creates a 360 - degree coverage pattern. Circular pattern covers wide areas. Ceiling or mast pole mounted.	Open office areas, conference rooms, warehouses, manufacturing floors, outdoor seating areas, indoor/outdoor retail environments.
 Dipole	Creates a 360 - degree coverage pattern. Can be bent at different angles to modify the coverage for wall and ceiling mounting as needed. Available in colors for aesthetic preferences.	Office areas, classrooms, hallways, conference rooms, shared (multitenant) environments.
 Directional (including patch and Yagi)	Focuses the radio signal to direct energy in certain directions. Patch and Yagi antennas are typically mounted to a wall or a mast and provide coverage in a limited - angle pattern.	Down a hallway in a hospital or office corridor. In a warehouse or manufacturing facility with high steel shelving. In mining shafts and drifts.

\* Indoor access points require RP TNC connectors; outdoor APs require N-Type connectors.






## Cisco Aironet 2.4 GHz Omni-directional Antenna

SKU	Installation/Dimensions	Gain (dBi)
 AIR-ANT2420V-N	12.70 x 2.54 cm	2.0
 AIR-ANT2450V-N	27.94 x 2.54 cm	5.0
 AIR-ANT2480V-N	49.53 x 2.22 cm	8.0



## Cisco Aironet 2.4 GHz Directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
 AIR-ANT2413P2M-N	Patch 19.81 x 19.81 x 3.05 cm 0.61 kg	13.0


## Cisco Aironet Dual-band Omni-directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
 AIR-ANT2524V4C-R	Ceiling mount 18.42 x 18.42 x 2.54 cm 0.59 kg	2.0 (2.4 GHz) 4.0 (5 GHz)
 AIR-ANT2544V4M-R	Wall mount 55.37 x 16.00 cm 0.67 kg	4.0 (2.4 GHz) 4.0 (5 GHz)
 AIR-ANT2547V-N	28.19 x 3.18 cm 170 g	4.0 (2.4 GHz) 7.0 (5 GHz)
 AIR-ANT2547VG-N	28.19 x 3.18 cm 170 g	4.0 (2.4 GHz) 7.0 (5 GHz)
 AIR-ANT2568VG-N	37.59 x 3.81 cm 204 g	6.0 (2.4 GHz) 8.0 (5 GHz)





## Cisco Aironet 5 GHz Omni-directional Antenna

SKU	Installation/Dimensions	Gain (dBi)
 AIR-ANT5140V-N	12.70 x 2.54 cm	4.0
 AIR-ANT5180V-N	27.94 x 2.54 cm	8.0

## Cisco Aironet 5 GHz Directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
 AIR-ANT5114P2M-N	Patch 19.81 x 19.81 x 3.05 cm 0.61 kg	14.0

## Cisco Aironet Dual-band Dipole Antenna

SKU	Color/Dimensions/Weight	Gain (dBi)
 AIR-ANT2524DB-R	Black 16.84 x 2.11 cm 36.85 g	2.0 (2.4 GHz) 4.0 (5 GHz)
 AIR-ANT2524DG-R	Grey 16.84 x 2.11 cm 36.85 g	2.0 (2.4 GHz) 4.0 (5 GHz)
 AIR-ANT2524DW-R	White 16.84 x 2.11 cm 36.85 g	2.0 (2.4 GHz) 4.0 (5 GHz)
 AIR-ANT2535SDW-R	White 8.38 x 3.18 cm 48.19 g	3.0 (2.4 GHz) 5.0 (5 GHz)


## Cisco Aironet Dual-band Directional Antenna

SKU	Installation/Dimensions/Weight	Gain (dBi)
 AIR-ANT2566P4W-R	Patch 16.00 x 27.94 x 3.05 cm 0.64 kg	6.0 (2.4 GHz) 6.0 (5 GHz)
 AIR-ANT2566D4M-R	Patch 25.40 x 25.40 x 4.09 cm 1.36 kg	6.0 (2.4 GHz) 6.0 (5 GHz)
 AIR-ANT2588P3M-N	Patch 30.48 x 17.78 x 2.79 cm 0.45 kg	8.0 (2.4 GHz) 8.0 (5 GHz)
 AIR-ANT2513P4M-N	Patch 30.48 x 17.78 x 2.79 cm 0.45 kg	13.0 (2.4 GHz) 13.0 (5 GHz)

For more information, check the antenna selection guide:

 <http://cs.co/9003DE2Kv>

For details on Cisco Aironet Antennas, visit the following Web site:

 [www.cisco.com/go/antenna](http://www.cisco.com/go/antenna)

#### ■ Cisco Aironet 2.4 GHz Omni-directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT2420V-N	2.0	-	-	-	-	-	-	-	-	-	●
AIR-ANT2450V-N	5.0	-	-	-	-	-	-	-	-	●	●
AIR-ANT2480V-N	8.0	-	-	-	-	-	-	-	-	●	●

#### ■ Cisco Aironet 5 GHz Omni-directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT5140V-N	-	4.0	-	-	-	-	-	-	-	-	●
AIR-ANT5180V-N	-	8.0	-	-	-	-	-	-	-	●	●

#### ■ Cisco Aironet 2.4 GHz Directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT2413P2M-N	13.0	-	-	-	-	-	-	-	-	●	●

#### ■ Cisco Aironet 5 GHz Directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT5114P2M-N	-	14.0	-	-	-	-	-	-	-	●	●

#### ■ Cisco Aironet Dual-band Di-pole Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT2524DB-R	2.0	4.0	●	●	●	●	●	●	●	-	-
AIR-ANT2524DG-R	2.0	4.0	●	●	●	●	●	●	●	-	-
AIR-ANT2524DW-R	2.0	4.0	●	●	●	●	●	●	●	-	-
AIR-ANT2535SDW-R	3.0	5.0	●	●	●	●	●	●	●	-	-

#### ■ Cisco Aironet Dual-band Omni-directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT2524V4C-R	2.0	4.0	●	●	●	●	●	●	●	-	-
AIR-ANT2544V4M-R	4.0	4.0	●	●	●	●	●	●	●	-	-
AIR-ANT2547V-N	4.0	7.0	-	-	-	-	-	-	-	●	●
AIR-ANT2547VG-N	4.0	7.0	-	-	-	-	-	-	-	●	●
AIR-ANT2568VG-N	6.0	8.0	-	-	-	-	-	-	-	●	●

#### ■ Cisco Aironet Dual-band Directional Antenna Model Compatibility Comparison

SKU	Gain (dBi)		Compatible Models								
	2.4 GHz	5 GHz	1852E	2702E	2802E	3702E	3702P	3802E	3802P	1562E	1572E
AIR-ANT2566P4W-R	6.0	6.0	●	●	●	●	●	●	●	-	-
AIR-ANT2566D4M-R	6.0	6.0	●	●	●	●	●	●	●	-	-
AIR-ANT2588P3M-N	8.0	8.0	-	-	-	-	-	-	-	●	●
AIR-ANT2513P4M-N	13.0	13.0	-	-	-	-	●	-	●	●	●

#### ■ Cisco Aironet Power Supply Options

SKU	Description	Compatible Models															
		1810	1810w	1815i	1815m	1815t	1815w	1830	1850	1700	2700	2800	3700	3800	1540	1560	1570
AIR-PWRINJ5=	Power Injector	●	●	●	●	-	●	● <sup>*1</sup>	● <sup>*1</sup>	●	● <sup>*2</sup>	-	-	-	●	-	-
AIR-PWRINJ6=	Power Injector	●	●	●	●	-	●	●	●	●	●	●	●	●	●	● <sup>*3</sup>	-
AIR-PWRINJ1500-2=	Power Injector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	● <sup>*4</sup>
AIR-PWRINJ-60RGD1=	Power Injector	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●
AIR-PWRINJ-60RGD2=	Power Injector	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●
AIR-PWR-B=	Power Supply Module	-	-	-	-	-	-	-	●	●	-	●	-	-	-	-	-
AIR-PWR-C=	Power Supply Module	-	-	-	-	-	-	●	●	-	-	-	-	-	-	-	-
AIR-PWR-D=	Power Supply Module	●	●	-	-	●	-	●	●	-	-	-	-	-	-	-	-
AIR-PWR-50=	Power Supply Module	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-
AIR-PWRADPT-1530=	Power Supply Module	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AIR-PWRADPT-RGD1=	Power Supply Module	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-






\*1 Full features are supported when powered via PoE+, AIR-PWRINJ6= or AIR-PWR-C= (The AIR-PWRINJ5 supports PoE receiving only).

\*2 Full features are supported when powered via PoE+, AIR-PWRINJ6= or AIR-PWR-B= (The AIR-PWRINJ5 supports PoE receiving only).

\*3 Cisco Aironet 1562: Full features are supported when powered via UPOE, AIR-PWRINJ-60RGD1/2= or AIR-PWRADPT-RGD1= (The AIR-PWRINJ6 supports PoE+ receiving only).

\*4 Cisco Aironet 1572Cn is not supported.

# Cisco Wireless Controllers

Appliance/ Virtual Machine	 Cisco 3500 Series Wireless Controller	 Cisco Virtual Wireless Controller	 Cisco 5500 Series Wireless Controller	 Cisco 8500 Series Wireless Controller
Access Point (Mobility Express)	 Cisco Aironet 1800/2800/3800/1560 Series			

## Number of Managed Access Points

→ More

### ■ Cisco 3504 Wireless Controller



Access Points	150 in Centralized mode
Clients	3000 in Centralized mode
Throughput	4Gbps
HA Support	Dedicated RP for HA SSO
Service Support	Dedicated SP
Form factor	Side by Side Primary/HA rack mount (1 RU)
I/O Interface	mGig + 4x1GE, USB
Console	RJ45, mini USB

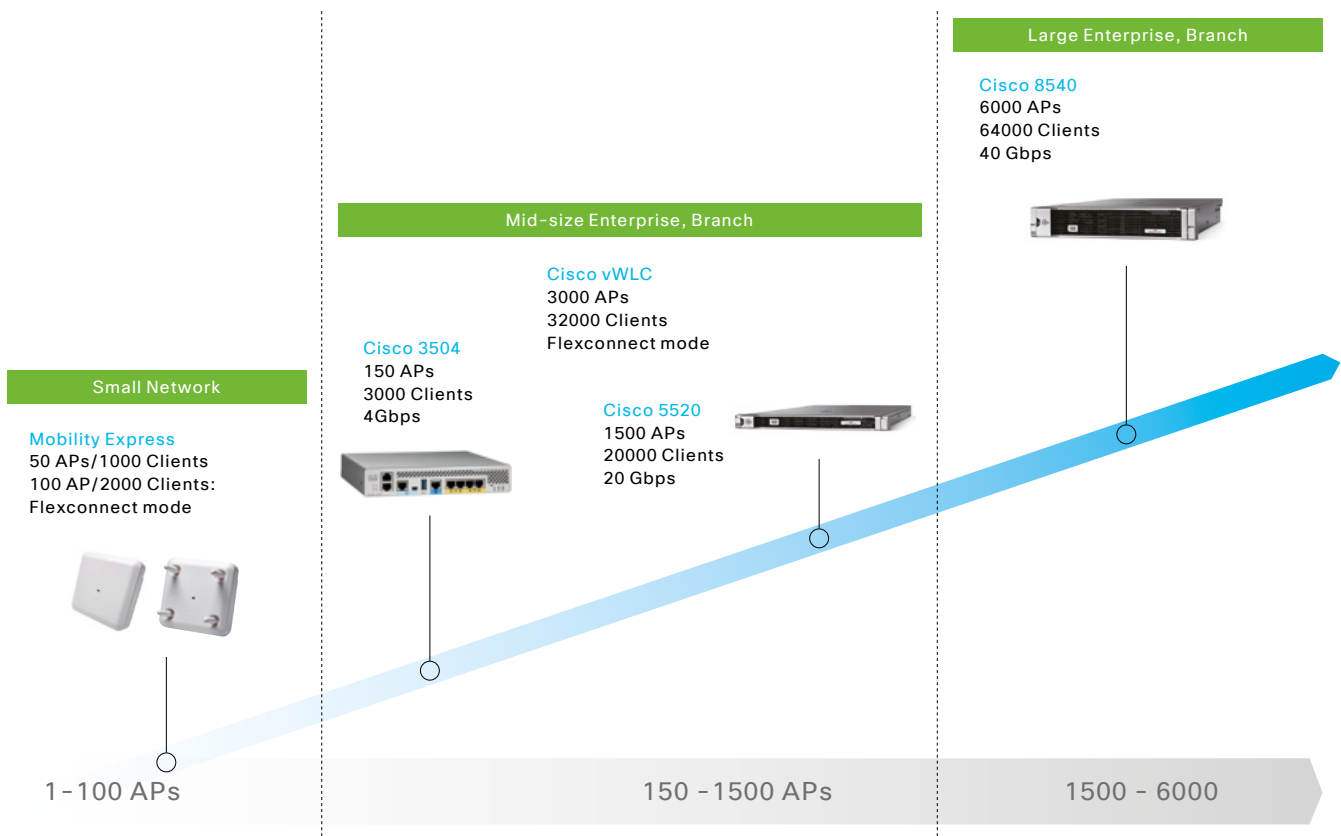
Access Points	Powerful enough to handle 802.11ac Wave 2 traffic loads Up to 150 AP, 3000 clients, 4Gbps
Seamless Scalability	Seamless migration (USB + configuration migration tool from 2504 and 5508) Seamless WLC portfolio – feature parity across 3504 and 5520
Flexible Deployment	mGig or 4x1GE Rack Mount, Cabinet, Desktop ready: • 1RU, side by side Rack Mount • Quiet fanless for cabinet, desktop (up to 30C ambient) 10" depth to fit nicely in cabinet
HA Support	Pairing with stateful switchover

Compact, mGig ready, edicated RP/SP ports, side by side rack mount and much more... The Cisco 3504 Wireless Controller provides centralized control, management, and troubleshooting for small to medium-sized enterprises and branch offices. It offers flexibility to support multiple deployment modes in the same controller—a centralized mode for campus environments, Cisco FlexConnect® mode for lean branches managed over the WAN, and a mesh (bridge) mode for deployments in which full Ethernet cabling is unavailable. As a component of the Cisco Unified Wireless Network, the 3504 controller provides real-time communications

between Cisco Aironet® Access Points, Cisco Prime® Infrastructure, and the Cisco Mobility Services Engine, and is interoperable with the Cisco 5520 and 8540 Wireless Controllers.

For details on the [Cisco 3504 Wireless Controller](http://cs.co/9008DE23w), visit the following Web site:

 <http://cs.co/9008DE23w>



\*1 L-LIC-CT2504-UPG is required. \*2 L-LIC-CTVM-UPG is required. \*5 L-LIC-CT8500-UPG or L-LIC-CT8540-UPG is required.

■ Cisco 3500 Series Wireless Controller

Dimensions (Height x Width x Depth): 4.39 x 21.4 x 21.6 cm Maximum Weight: 1.99 kg

SKU	OS	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
		Maximum							10GE	GE	mGlg	
AIR-CT3504-K9	AireOS	150		3,000	-	4 Gbps	●	●	1	4	1	-

■ Cisco Virtual Wireless Controller

SKU	OS	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
		Default	Maximum						GE	SFP	SFP +	
L-AIR-CTVM-5-K9	AireOS	5	3,000	32,000	3,000	500 Mbps	●	-	-	-	-	-

■ Cisco 5500 Series Wireless Controller (5520)

SKU	OS	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
		Default	Maximum						GE	SFP	SFP +	
AIR-CT5520-K9	AireOS	0	1,500	20,000	25,000	20 Gbps	●	●	-	-	2	1 RU
AIR-CT5520-50-K9	AireOS	50	1,500	20,000	25,000	20 Gbps	●	●	-	-	2	1 RU

■ Cisco 8500 Series Wireless Controller (8540)

SKU	OS	Managed Access Points		Clients	RF tags	Throughput	Office Extend	Wireless Mesh	Ports			Rack mount
		Default	Maximum						GE	SFP	SFP +	
AIR-CT8540-K9	AireOS	0	6,000	64,000	50,000	40 Gbps	●	●	-	-	4	2 RU
AIR-CT8540-1K-K9	AireOS	1,000	6,000	64,000	50,000	40 Gbps	●	●	-	-	4	2 RU

■ Additional Access Point License for Cisco 2500 Series Wireless Controller<sup>\*1</sup>

SKU	Additional	Compatible Models
L-LIC-CT2504-1A	1	2504
L-LIC-CT2504-5A	5	2504
L-LIC-CT2504-25A	25	2504

■ Additional Access Point License for Cisco Virtual Wireless Controller<sup>\*2</sup>

SKU	Additional	Compatible Models
L-LIC-CTVM-1A	1	-
L-LIC-CTVM-5A	5	-
L-LIC-CTVM-25A	25	-

■ Additional Access Point License for Cisco 5500 Series Wireless Controller<sup>\*4</sup>

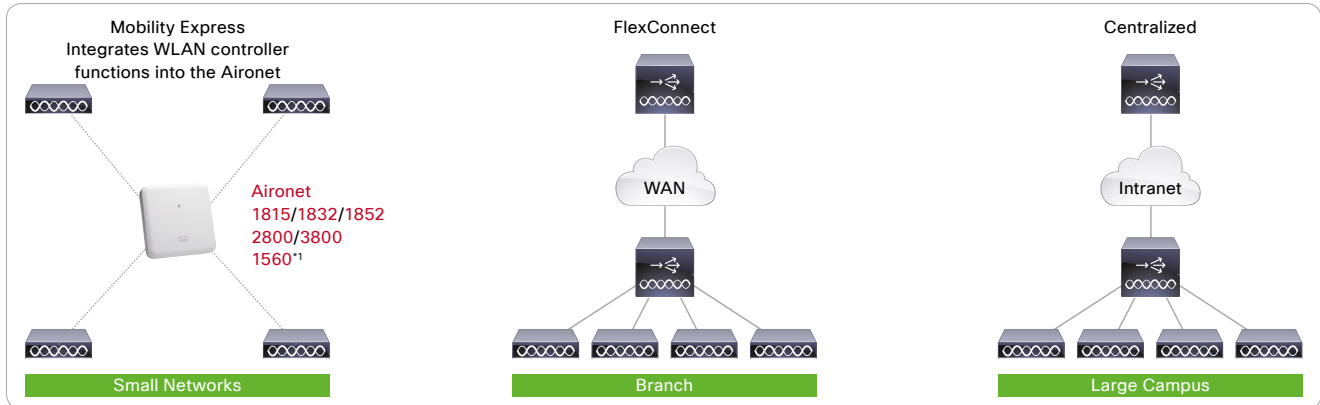
SKU	Additional	Compatible Models
LIC-CT5520-1A	1	5520

■ Additional Access Point License for Cisco 8500 Series Wireless Controller<sup>\*5</sup>

SKU	Additional	Compatible Models
LIC-CT8540-1A	1	8540

## Deployment Modes

Cisco's wireless solutions can be broadly classified into **Standalone** systems that operate **Cisco Aironet Access Points** individually and **Controller-based** systems that centrally manage multiple Cisco Aironet Access Points using a **Cisco Wireless Controller**. Multiple expansion modes are also supported in Controller-based systems.



The **Mesh** Mode, **FlexConnect + Mesh** Mode, **OfficeExtend** Mode, **Monitor** Mode, **Rogue Detector** Mode, and **Sniffer** Mode are also supported.

■ Cisco Wireless Controller Deployment Mode Compatibility Comparison

Platform	Deployment Modes				
	Mobility Express	FlexConnect	Centralized	Mesh	OfficeExtend
Cisco Aironet 1800 Series Access Points	●	-	-	-	-
Cisco Aironet 2800/3800 Series Access Points	●	-	-	-	-
Cisco Aironet 1560 Series Outdoor Access Points	●*1	-	-	-	-
Cisco Aironet 3500 Series Wireless Controller	-	●	●	●	●
Cisco Virtual Wireless Controller	-	●	-	-	-
Cisco 5500 Series Wireless Controller	-	●	●	●	●
Cisco 8500 Series Wireless Controller	-	●	●	●	●

\*1 Cisco Aironet 1560 Series are to be supported in future software release. \*2 Cisco Wireless Controller Software release 7.3.112.0 is required. \*3 Cisco AireOS 8.1 and higher are not supported.



# Subscription-based software designed to make networking simple

## DNA for Access Wireless. Cisco Introduces a New Era in Networking, Powered by Software Innovation and Subscription Buying

As we transition our network infrastructure closer to the software-defined networking architecture, it is imperative that we simplify our software licensing strategy.

Cisco DNA Advantage and Essentials subscription-based network software will transform how infrastructure software is bought and deployed in the new era of networking. These latest innovations reinforce Cisco's commitment to transition its business to a software-centric, subscription-based model, while helping accelerate our customers' digital transformation.

**DNA Essentials:** Provides base automation and monitoring capabilities, while also positioning us to win deals through competitive capabilities/pricing. It includes the Cisco DNA Essentials feature-set, Access Point licenses with full portability to run any Access Point on any Controller, Cisco Prime Lifecycle and Assurance licenses, and embedded Cisco Software Support.


**DNA Essentials**

Single SKU 3/5/7 Year Subscription

Prime

AP License

DNA Advantage (Includes DNA Essentials)



Wave 2 Aironet AP's and Controllers – 3504, 5520, 8510 and 8540

DNA Essentials	
<b>Competitive Differentiators</b> Full Netflow, Apple Fastlane, AVC, High Density optimized	<b>Basic Automation</b> Plug and Play, EasyQoS Configuration, SSID and AP-Group automation, ISE Guest wireless, Wireless Maps
<b>Basic Monitoring Capabilities</b> Network Health, Client and Device 360, Application Visibility, Insights, Reports	<b>Element Management</b> Image Management, Topology and Discovery
AP License	
<b>Enhanced Security</b> DNS / IP ACL, TrustSec, WIPS, Device profiling, Local policy	<b>Flexible Network Segmentation</b> LISP for Access, VXLAN support
<b>Reduced Network Downtime</b> Client SSO, Optimized image AP download	<b>Optimized RF</b> HDX, Clean Air, FRA, Optimized Roaming, 802.11r/k/v, ATF
<b>Advanced features</b> Bonjour/Chromecast gateway, Lync SDN	<b>IoT Optimized</b> Identity PSK

**Enable Base Automation and Monitoring in DNA Center**

**DNA Advantage:** Cisco DNA advantage delivers policy-based, automation with SD Access, monitoring, and Cisco DNA Assurance.

**DNA Advantage (Inclusive of DNA Essentials)**

<b>Software-defined Access</b> Policy-based Automation and Assurance, SmartFabric, SD-Access Wireless	<b>SD-Access Border Capabilities</b> Cross-domain Connectivity, LISP Extranet, L2 Gateway
<b>Security and Analytics Capabilities</b> SLN, SD-AVC, IPSec, Location	<b>Network Analytics</b> Proactive health monitoring, Machine learning, Application 360, Sensor 360
AP License	
<b>Enhanced Security</b> DNS / IP ACL, TrustSec, WIPS, Device profiling, Local policy	<b>Flexible Network Segmentation</b> LISP for Access, VXLAN support
<b>Reduced Network Downtime</b> Client SSO, Optimized image AP download	<b>Optimized RF</b> HDX, Clean Air, FRA, Optimized Roaming, 802.11r/k/v, ATF
<b>Advanced features</b> Bonjour/Chromecast gateway, Lync SDN	<b>IoT Optimized</b> Identity PSK


**Cisco ONE Advantage**

Single SKU 3/5/7 Year Subscription

Prime

AP License

DNA Advantage (Includes DNA Essentials)



Wave 2 Aironet AP's and Controllers – 3504, 5520, 8510 and 8540

Available on Wave 1 with limited functionality

**Customer Need to buy ISE to Enable Full DNA Capability**

**Cisco ONE Advantage:** Protect assets with enhanced policy and security via all DNA & Security use cases. Cisco ONE Advantage includes the Cisco DNA Advantage package (ABOVE) plus 15 sessions of ISE Base and ISE Plus licenses, a Cisco Connected Mobile Experience (CMX) Base license, and embedded Cisco Software Support.

**DNA Advantage (Inclusive of DNA Essentials)**

<b>Software-defined Access</b> Policy-based Automation and Assurance, SmartFabric, SD-Access Wireless	<b>SD-Access Border Capabilities</b> Cross-domain Connectivity, LISP Extranet, L2 Gateway
<b>Security and Analytics Capabilities</b> SLN, SD-AVC, IPSec, Location	<b>Network Analytics</b> Proactive health monitoring, Machine learning, Application 360, Sensor 360
AP License	
<b>Enhanced Security</b> DNS / IP ACL, TrustSec, WIPS, Device profiling, Local policy	<b>Flexible Network Segmentation</b> LISP for Access, VXLAN support
<b>Reduced Network Downtime</b> Client SSO, Optimized image AP download	<b>Optimized RF</b> HDX, Clean Air, FRA, Optimized Roaming, 802.11r/k/v, ATF
<b>Advanced features</b> Bonjour/Chromecast gateway, Lync SDN	<b>IoT Optimized</b> Identity PSK

**Cisco ONE Advantage**


Single SKU 3/5/7 Year Subscription

CMX Base

Prime

AP License

DNA Advantage (Includes DNA Essentials)



Wave 2 Aironet AP's and Controllers – 3504, 5520, 8510 and 8540

Available on Wave 1 with limited functionality

**Enable All DNA and Security Use Cases including SDA, Assurance**

### Benefits

The value of subscription buying becomes clear as customers take advantage of this new era in networking:

- Software evolves at lightning speed. Subscription buying assures customers that their software is always up-to-date in today's changing environments
- Subscriptions simplify the purchase of software suites across Cisco's portfolio, and help the customer scale throughout their business as they grow and take advantage of additional capabilities from Cisco
- As Cisco continues to add value and features, subscription offers give customers quick, easy access to ongoing innovation
- Subscriptions enable customers to accelerate deployment of new capabilities and implementation of new business models by reducing entry costs through the use of OPEX instead of CAPEX

In addition to transactional purchasing, customers can also choose to access the latest DNA innovation across their infrastructure through the **Cisco Enterprise Agreement** (Cisco EA), which I blogged about last month. Cisco EA is a single, simple agreement that gives customers a flexible, attractive way to consume and deploy Cisco Software. Cisco EA is more than a licensing agreement. It's our platform for building deep, meaningful customer relationships wherein Cisco continually adds value to what we offer our customers, and is a key part of our strategy to connect more directly to our customers' business needs.



Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

Cisco Services

Programs & Promotions

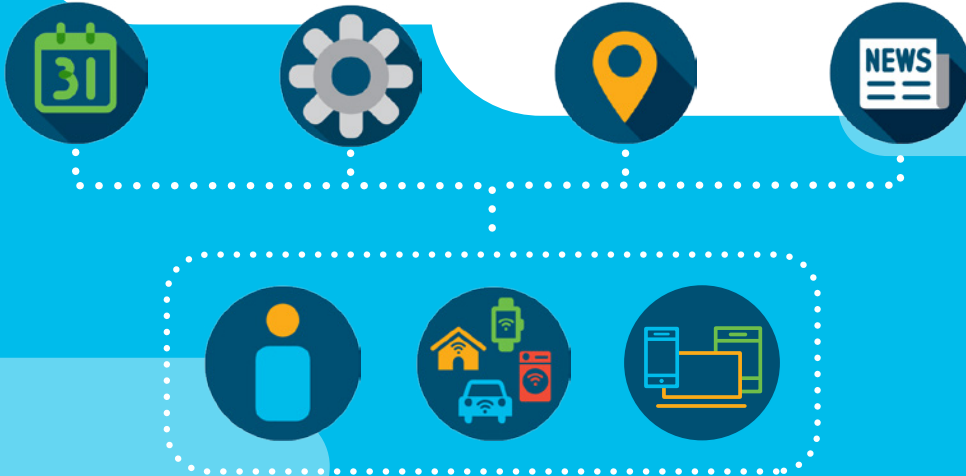
# Routing

Integrated Services Routers



Routing

Can your  
**WAN**  
keep up?



**More users, more apps, different devices, but old network.**

Cisco WAN Solutions can help.

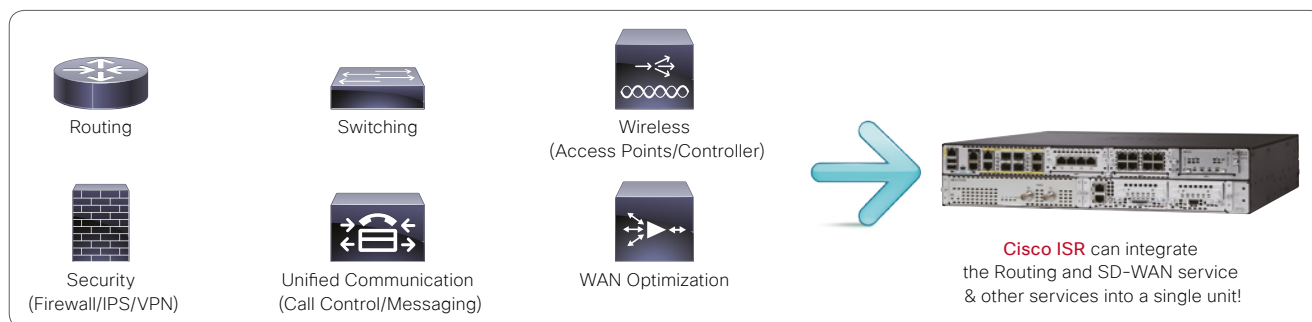
ISR Routing Platforms 800, 1000, 4000	Page 69
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## Line-up of Cisco ISR

Previously, even the small-scale bases were required to install a wide range of devices including switches, wireless access points and WAN optimization appliances. **Cisco Integrated Services Routers (ISR)** are "super routers" that are capable of integrating the network services provided by these multiple devices into a single platform. These routers are not only capable of integrating

multiple services but also have the flexibility to add new services as required via license activation and/or addition of expansion modules. Adoption of these routers results in simpler network configuration, helping to reduce the device costs as well as operation and maintenance costs.



High ↓	Performance & Functionality	<p>Cisco ISR 1100</p>		<p>4431</p>	
		<p>890 Series</p>		<p>4451</p>	
<p>810 Series</p>		<p>880 Series</p>		<p>4321</p>	
<p>860 Series</p>				<p>4331</p>	
		Fixed-configuration		Modular (NIM/SM-X) <sup>1)</sup>	

### Cisco ISR 800 Series

Fixed-configuration latest generation integrated services routers suitable for deployment in small-sized branches, home offices and Machine-to-Machine (M2M) environments.



See page 69 for details.

### Cisco 1100

Fixed-configuration high performance routers, Small yet powerful, they provide highly secure broadband, Metro Ethernet, and wireless LAN connectivity.



See page 70 for details.

### Cisco ISR 4000 Series

Modular latest generation integrated services routers suitable for deployment in branches that require a provision of application-aware services.



See page 71 for details.

Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

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## NEW: Cisco 1000 Series Integrated Services Router

### Reliability, security, and performance

The latest addition to the Cisco Integrated Service Router Portfolio Digital ready, fixed-platform branch routers with advanced capabilities.

The Cisco 1000 Series ISR platform with a small form factor is best suited for small and midsize businesses, enterprise branches, and as customer premises equipment in managed services environments. The routers come in two models: an 8-LAN-port option and a 4-LAN-port option. They have high performance with Gigabit Ethernet packet forwarding capabilities. The multicore architecture has separate cores for data plane and control plane. The 1000 Series ISRs support Power over Ethernet (PoE) and PoE+ to power branch devices such as IP phones and cameras. They are easy to deploy with zero-touch provisioning using Plug-and-Play capability. There are multiple LAN, WLAN, WAN, and LTE combinations to choose from, depending on your branch needs. The 1000 Series can be used in ATMs, retail stores, and kiosks, as well as for various other purposes.



### Benefits of Migrating to Cisco ISR 4000 Series

The Cisco ISR 4000 Series build on 20 years of branch-office routers, adding services and horsepower for the needs of modern branch offices and allowing businesses to:

- Quickly open new remote offices or easily add additional services
- Operate an entire branch office with a single box
- Give IT departments more time for innovation by automating repetitive tasks and orchestrating security and application services

The Cisco ISR 4000 Series address the problems that modern branch offices face, without giving up any of the existing services of previous-generation Cisco ISRs. It also brings Services Containers Virtualisation to networking so that IT can adopt services faster and repurpose resources as needs change. And it delivers additional computing power for local application survivability, data backup, and local analytics processing.





The new architecture of the Cisco ISR 4000 Series delivers up to 2 Gbps in a converged platform, typically 4 to 10 times faster than the previous-generation ISRs.

Cisco ISR 4000 Series is the Leading platform for Cisco SD-WAN solution deployment. Cisco ISR 4000 Series allow customers to easily deploy their branches in classical or SD-WAN context.

The virtualization technology available both embedded (Integrated Services Containers) within the Cisco ISR 4000 Series and through additional data center-class server modules (Cisco UCS E Series Servers) offers new levels of converged capability.



#### Series Comparison

Branch Network Needs	Features	Cisco ISR 1800/2800/3800 Series	Cisco ISR 1900/2900/3900 Series	Cisco ISR 4000 Series	Benefits
 <b>Scale with high performance</b>	Maximum throughput	Up to 50 Mbps	Up to 350 Mbps	Up to 2 Gbps	4 to 10 times performance increase for the same price as the ISR G2
	Separate data, control, and services planes	-	-	•	Minimal performance impact as network services are added and throughput increases
	Integrated service container	-	-	•	No need for additional branch appliances; add network services using pluggable virtual machines
	Integrated compute with Cisco UCS E-Series Servers	-	•	•	Local compute resources for applications, data backup, and analytics
	Cisco IOS XE Operating System	-	-	•	Higher availability for network services with multicore processing
 <b>Uncompromised user experience</b>	Cisco Application Visibility and Control (AVC)	-	•	•	Visibility into 1000+ applications for capacity planning and prioritization
	Intelligent path selection (PfR v3)	-	•	•	Improve application experience and lower costs with path selection using real-time analytics
	WAN optimization (WAAS and Akamai)	-	-	-	Integrated application performance and offload WAN with Layer 4-7 optimization
 <b>Security</b>	Sourcefire Intrusion Detection System (IDS)	-	•	•	Industry-leading advanced threat defense
	Cloud Web Security with Advanced Malware Protection (AMP)	-	•	•	Scale secure direct Internet access with consistent policy enforcement
	Multicore hardware VPN acceleration	-	-	•	High-performance encryption for secure WAN
 <b>Reduced costs and increased business agility</b>	Pay-as-you-grow performance and services	-	-	•	Ability to buy what you need today and upgrade anytime without complete equipment upgrades
	Cisco ONE Software Suites	-	•	•	Predictable OpEx spend, license portability, and investment protection
	Intelligent WAN app with Cisco APIC Enterprise Module	-	•	•	Automated provisioning for faster deployment



# Cisco ISR 800 Series

Fixed-configuration Integrated Services Routers suitable for deployment in small-sized branches, home offices and Machine-to-Machine (M2M) environments. In addition to the routing service, a wide variety of services including switching, wireless security, unified communication, and entry-level WAN optimization can be integrated using a single router unit.

## Highlights

- Equipped with Cisco IOS Universal Image (Compatible with **IP Base/Advanced Security/Advanced IP Services**)
- Built-in managed switch
- Built-in IEEE 802.11n/ac-compatible wireless access point with full Airport support (**C881W-x-K9**)
- Supports 4G LTE wireless WAN



Family	SKU	Lan Ports		WLAN		WAN Ports					Security			Speedup	Voice	Rack mount
		FE	GE	AP	FE	GE	GE SFP2	V.92/ISDN	xDSL	4G LTE	FW	IPS	VPN	WAASX		
819	C819H-K9	4				1						Y	Y	Y		
	C819HWD-E-K9	4		AGN		1						Y	Y	Y		
	C819G-4G-GA-K9	4				1				Y	Y	Y	Y			
	C819GW-LTE-GA-EK9	4		AGN		1				Y	Y	Y	Y			
860	C866VAE-K9	3	1			1			ADSL/VDSL Annex B/J1		Y	N	Y			No
	C866VAE-W-E-K9	3	1	802.11n		1			ADSL/VDSL Annex B/J1		Y	N	Y			No
	C867VAE-K9	3	1			1			ADSL/VDSL Annex A		Y	N	Y			No
	C867VAE-W-E-K9	3	1	802.11n		1			ADSL/VDSL Annex A		Y	N	Y			No
880	C881-K9	4			1						Y	Y	Y			Option
	C881WD-E-K9	4		11ac	1						Y	Y	Y			Option
	C881G-4G-GA-K9	4			1					yes	Y	Y	Y			Option
	C886VA-K9	4							ADSL/VDSL Annex B/J1		Y	Y	Y			Option
	C886VA-W-E-K9	4		11n					ADSL/VDSL Annex B/J1		Y	Y	Y			Option
	C886VAG-LTE-GA-K9	4							ADSL/VDSL Annex B/J1	yes	Y	Y	Y			Option
	C887VA-K9	4							ADSL/VDSL Annex A		Y	Y	Y			Option
	C887VA-WD-E-K9	4		11ac					ADSL/VDSL Annex A		Y	Y	Y			Option
	C887VAG-4G-GA-K9	4							ADSL/VDSL Annex A	yes	Y	Y	Y			Option
	C887VAM-K9	4							ADSL/VDSL Annex M		Y	Y	Y			Option
	C887VAM-W-E-K9	4		11n					ADSL/VDSL Annex M		Y	Y	Y			Option
	C888-K9	4							G.SHDSL EFM/ATM		Y	Y	Y			Option
890	C891F-K9	8			1	1	1	y/y			Y	Y	Y			Option
	C891-24X-K9	24			0	2	2				Y	Y	Y			yes
	C891FW-E-K9	8		AGN	1	1	1	y/y			Y	Y	Y			Option
	C892FSP-K9	8			0	2	1				Y	Y	Y			Option
	C896VA-K9	8			0	1	1	ISDN	ADSL/VDSL Annex B/J1		Y	Y	Y			Option
	C896VAG-LTE-GA-K9	8			0	1	1		ADSL/VDSL Annex B/J1	Y	Y	Y	Y			Option
	C897VA-K9	8			0	1	1	ISDN	ADSL/VDSL Annex A		Y	Y	Y			Option
	C897VAW-E-K9	8		AGN	0	1	1		ADSL/VDSL Annex A		Y	Y	Y			Option
	C897VAM-W-E-K9	8		AGN	0	1	1		ADSL/VDSL Annex M		Y	Y	Y			Option
	C897VA-M-K9	8			0	1	1		ADSL/VDSL Annex M		Y	Y	Y			Option
	C897VAG-LTE-GA-K9	8			0	1	1		ADSL/VDSL Annex A	Y	Y	Y	Y			Option
	C897VAMG-LTE-GA-K9	8			0	1	1		ADSL/VDSL Annex M	Y	Y	Y	Y			Option
	C897VAB-K9	8			0	1	1		ADSL/VDSL Annex A		Y	Y	Y			Option
	C897VAGW-LTE-GAEK9	8		AGN	0	1	1		ADSL/VDSL Annex A + Bonding	Y	Y	Y	Y			Option
	C898EA-K9	8			0	1	1		G.SHDSL EFM/ATM		Y	Y	Y			Option
	C898EAG-LTE-GA-K9	8			0	1	1		G.SHDSL EFM/ATM	Y	Y	Y	Y			Option
	C899G-LTE-GA-K9	8			0	2	1			Y	Y	Y	Y			Option

## Machine-to-Machine (M2M)

Machine-to-Machine (M2M) is a technology that aggregates the intercommunications between machines without human intervention. This technology is already used in a wide range of devices such as vending machines, surveillance systems and sensor-equipped measuring instruments; and its adoption is expected to continue at an accelerated pace. The most important elements for network devices offering the M2M technology are compactness, mobility and durability.

In the case of vending machines, for example, the network device needs to be compact to allow installation inside the machines. Mobility is also important as it is cheaper to use the mobile 4G network than installing a wired broadband line for each vending machine. Depending on the installation location, the network device must also have the durability to withstand the high temperatures in summer.

Cisco 819H/G/HG has been developed to address these issues. Both models feature a palm-sized compact chassis and are compatible with 4G LTE 2.0 wireless LAN. Furthermore, Cisco 819H/HG can operate in temperatures between -23 and +60 deg C and in up to 95% humidity and have superior vibration and impact resistance to withstand industrial use. A wide variety of mounting options are supported including DIN rail, floor and wall mounting.



Switches

Wireless

Routing

Security

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# Cisco ISR 1000 Series

## ■ Reliability, security, and performance

Get Internet access, advanced security, and wireless services in one device. Cisco 1000 Series Integrated Services Routers (ISRs) are fixed, high-performance routers that are easy to deploy and manage. Small yet powerful, they provide highly secure broadband, Metro Ethernet, and wireless LAN connectivity.

## ■ Next-generation connectivity

Get increased mobility and next-generation WAN and LAN options. Access SFP/SFP+, DSL, LTE Advanced, and 802.11ac Wi-Fi. The 1000 Series is ideal for use as customer premises equipment.

## ■ Increased performance

Meet the demand for more bandwidth without more budget. The router's multicore architecture leverages higher data-plane performance, enabling high availability for network services.

## ■ Integrated enterprise-class security

Gain a highly secure WAN and enterprise-class security. Cisco Umbrella Branch and Trustworthy Systems provide high-performance encryption, VPN, firewall, and URL filtering.

## ■ Advanced wireless LAN

Enjoy wireless LAN capability at the branch, in a single box, that can run with or without a controller. Our 1000 Series integrates 802.11ac Wave 2 wireless with Cisco Mobility Express as an access point in every router.

## ■ Easy management and deployment

Use one operating system for consistency and visibility across all branch offices and remote sites. The 1000 Series is the first fixed-configuration router with Cisco's trusted IOS XE software.



## ■ Cisco ISR 1000 Series Comparison

SKU	Description	WAN	LAN (GE)	WiFi	LTE
C1111-8P	2 ETHERNET WAN, 8 LAN with IP Base	2GE	8	-	-
C1111-8PLTEEA	2 ETHERNET WAN, LTE ADVANCED with IP Base	2GE	8	-	●
C1111-8PWE	2 ETHERNET WAN, Wifi with IP Base	2GE	8	●	-
C1111-8PLTEEAWE	2 ETHERNET WAN, LTE ADVANCED, Wifi with IP Base	2GE	8	●	●
C1111-4P	2 ETHERNET WAN, 4 LAN with IP Base	2GE	4	-	-
C1111-4PLTEEA	2 ETHERNET WAN, LTE ADVANCED with IP Base	2GE	4	-	●
C1111-4PWE	2 ETHERNET WAN, Wifi with IP Base	2GE	4	●	-
C1116-4P	ADSL/VDSL over ISDN, 4 LAN with IP Base	1GE, VA-B	4	●	●
C1116-4PLTEEA	ADSL/VDSL over ISDN, LTE ADVANCED with IP Base	1GE, VA-B	4	-	-
C1116-4PWE	ADSL/VDSL over ISDN, Wifi with IP Base	1GE, VA-B	4	-	●
C1116-4PLTEEAWE	ADSL/VDSL over ISDN, LTE ADVANCED, Wifi with IP Base	1GE, VA-B	4	●	-
C1117-4P	ADSL/VDSL over POTS, 4 LAN with IP Base	1GE, VA-A	4	-	-
C1117-4PLTEEA	ADSL/VDSL over POTS, LTE ADVANCED with IP Base	1GE, VA-A	4	-	●
C1117-4PWE	ADSL/VDSL over POTS, Wifi with IP Base	1GE, VA-A	4	-	●
C1117-4PLTEEAWE	ADSL/VDSL over POTS, LTE ADVANCED, Wifi with IP Base	1GE, VA-A	4	●	-
C1117-4PM	ADSL/VDSL over POTS, Annex M 4 LAN with IP Base	1GE, VA-M	4	-	-
C1117-4PMLTEEA	ADSL/VDSL over POTS, Annex M LTE ADVANCED with IP Base	1GE, VA-M	4	-	●
C1117-4PWE	ADSL/VDSL over POTS, Annex M Wifi with IP Base	1GE, VA-M	4	●	-
C1117-4PLTEEAWE	ADSL/VDSL over POTS, Annex M LTE ADVANCED, Wifi with IP Base	1GE, VA-M	4	●	●

### Legend

VA-A ADSL/VDSL over POTS  
 VA-B ADSL/VDSL over ISDN  
 VA-M ADSL/VDSL over POTS Annex M

# Cisco ISR 4000 Series

Modular Integrated Services Routers suitable for deployment in bases that require a provision of application-aware services. In addition to the routing service, these routers can integrate a wide variety of services including switching, wireless security, unified communication, WAN optimization and service virtualization. Since the control, data, and service resources are isolated at the hardware level, it is possible to deliver application-aware services with high availability even when at high loads.



## ■ Highlights

- Equipped with Cisco IOS XE
- Equipped with multi-core CPU and 4 GB memory
- Equipped with multi-core CPU, 4 GB memory for the control plane and 2 GB Memory for the data plane
- Various network services are integrated via **Expansion Modules** (NIM/SM-X slots)
- Supports the **Cisco UCS E Series Server**

## ■ Cisco ISR 4000 A-la-carte Series Bundles Comparison

Bundles	Characters Included in SKU	Bundled Licenses/Modules				
		IOS SEC	IOS UC	IOS APP	CME/SRST	PVDM4
Security Bundles	SEC	●	-	-	-	-
Voice Bundles	V	-	●	-	-	●*1
Voice Security Bundles	VSEC	●	●	-	-	●*1
Application Experience Bundles	AX	●	-	●	-	-
Application Experience Voice Bundles	AXV	●	●	●	-	●*1

## ■ Cisco ISR 4000 Series A-la-carte

SKU	Cisco IOS	Expansion Slots			Ports						Speedup	Wireless				Security			Voice	Rack mount
		NIM	SM/SM-X	PVDM	FE	GE	ISDN Backup	xDSL	Voice	WAAS		AP	WLC	4G	FW	IPS	VPN	GW Call Control MSG		
ISR4321/K9	IP Base	2	-	1	-	2*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4321-SEC/K9	IP Base + SEC	2	-	1	-	2*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	●	●	-*6	●		
ISR4321-V/K9	IP Base + UC	2	-	1	-	2*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4321-AX/K9	IP Base + SEC + APP	2	-	1	-	2*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●		
ISR4321-AXV/K9	IP Base + SEC + UC + APP	2	-	1	-	2*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●		
ISR4331/K9	IP Base	2	1	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4331-SEC/K9	IP Base + SEC	2	1	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	●	●	-*6	●		
ISR4331-V/K9	IP Base + UC	2	1	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4331-AX/K9	IP Base + SEC + APP	2	1	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●		
ISR4331-AXV/K9	IP Base + SEC + UC + APP	2	1	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●		
ISR4351/K9	IP Base	3	2	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4351-SEC/K9	IP Base + SEC	3	2	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	●	●	-*6	●		
ISR4351-V/K9	IP Base + UC	3	2	1	-	3*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4351-AX/K9	IP Base + SEC + APP	3	2	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●		
ISR4351-AXV/K9	IP Base + SEC + UC + APP	3	2	1	-	3*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●		
ISR4431/K9	IP Base	3	-	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4431-SEC/K9	IP Base + SEC	3	-	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	●	●	●	-*6	●		
ISR4431-V/K9	IP Base + UC	3	-	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4431-AX/K9	IP Base + SEC + APP	3	-	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●		
ISR4431-AXV/K9	IP Base + SEC + UC + APP	3	-	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●		
ISR4451-X/K9	IP Base	3	2	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4451-X-SEC/K9	IP Base + SEC	3	2	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	●	●	-*6	●		
ISR4451-X-V/K9	IP Base + UC	3	2	1	-	4*2	-*3	-*3	-*3	-*4	-	-*3	-*3	-*5	-*5	-*5	-*6	●		
ISR4451-X-AX/K9	IP Base + SEC + APP	3	2	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●		
ISR4451-X-AXV/K9	IP Base + SEC + UC + APP	3	2	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	●	●		
ISR4451XWAAS-200G	IP Base + SEC + APP	2	2	1	-	4*2	-*3	-*3	-*3	●	-	-*3	-*3	●	●	●	-*6	●		

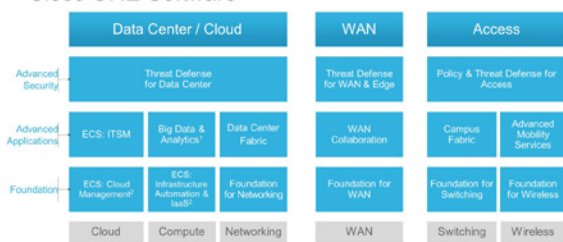
\*1 Cisco 4321 is not supported. \*2 SFP module slot or dual-purpose port is included. \*3 Expansion Module is required. \*4 Feature Licenses or Expansion Modules are required. \*5 Cisco IOS SEC License is required. \*6 Feature Licenses, etc. are required according to the Cisco IOS UC License and configuration.

## Cisco ONE Software for WAN on the Cisco ISR 4000 Series

Cisco ONE Software is a valuable and flexible way to buy software for your WAN. At each stage in the product lifecycle, Cisco ONE Software helps make buying, managing, and upgrading your network and infrastructure software easier. Cisco ONE provides customers with four key benefits:

- Access to software services-enabled ongoing innovation and new technology from Cisco
- Investment protection of software purchases through software services-enabled license portability
- Software suites that address typical customer use case scenarios at an attractive price
- Flexible licensing models to smoothly distribute customer's software spending over time. The diagram on the right shows available Cisco ONE suites for the ISR space.

### Cisco ONE Software



Switches

Wireless

Routing

Security

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# Modules & Accessories

## ■ Cisco IOS Technology Package Licenses

SKU	Description	Compatible Models																
		800	1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451
SL-4320-SEC-K9	Cisco IOS SEC License for Cisco ISR 4321	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
SL-4330-SEC-K9	Cisco IOS SEC License for Cisco ISR 4331	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-
SL-4350-SEC-K9	Cisco IOS SEC License for Cisco ISR 4351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-
SL-44-SEC-K9	Cisco IOS SEC License for Cisco ISR 4400 Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
SL-4320-UC-K9	Cisco IOS UC License for Cisco ISR 4321	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
SL-4330-UC-K9	Cisco IOS UC License for Cisco ISR 4331	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-
SL-4350-UC-K9	Cisco IOS UC License for Cisco ISR 4351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-
SL-44-UC-K9	Cisco IOS UC License for Cisco ISR 4400 Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
SL-4320-APP-K9	Cisco IOS APP License for Cisco ISR 4321	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
SL-4330-APP-K9	Cisco IOS APP License for Cisco ISR 4331	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-
SL-4350-APP-K9	Cisco IOS APP License for Cisco ISR 4351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-
FL-4320-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4321 <sup>*1</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
FL-4330-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4331 <sup>*1</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-
FL-4350-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4351 <sup>*1</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-
FL-44-HSEC-K9	Cisco IOS HSEC License for Cisco ISR 4400 Series <sup>*1</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
L-FL-CME-SRST-5	Cisco Unified CME or SRST 5 License <sup>*2*</sup>	●	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
L-FL-CME-SRST-25	Cisco Unified CME or SRST 25 License <sup>*2</sup>	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
L-FL-CME-SRST-100	Cisco Unified CME or SRST 100 License <sup>*2</sup>	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-5-RED	Cisco Unified BEe 5 Redundant Configuration License <sup>*2</sup>	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-25-RED	Cisco Unified BEe 25 Redundant Configuration License <sup>*2</sup>	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-100-RED	Cisco Unified BEe 100 Redundant Configuration License <sup>*2</sup>	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-500-RED	Cisco Unified BEe 500 Redundant Configuration License <sup>*2</sup>	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●
FL-CUBEE-1000-RED	Cisco Unified BEe 1000 Redundant Configuration License <sup>*2</sup>	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
L-FL-C800-APP	Cisco IOS APP License for Cisco ISR 800 Series <sup>*5</sup>	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FL-4320-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4321	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
FL-4330-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4331	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-
FL-4350-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-
FL-44-PERF-K9	Cisco IOS Performance-on-demand License for Cisco ISR 4400 Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
SL-44-APP-K9	Cisco IOS APP License for Cisco ISR 4400 Series	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●

\*1 Cisco IOS SEC License is required. \*2 Cisco IOS UC License is required. \*3 Cisco ISR 800 Series only supports Cisco 881-V. \*4 Cisco IOS APP License is required. \*5 Cisco ISR 800 Series only supports Cisco 891F/892FSP/897VA/899G.

## ■ Extension Module for Cisco ISR 1900/2900/3900/4000 Series (1 of 2)

SKU	Description	Slot	Compatible Models				
			4321	4331	4351	4431	4451
NIM-ES2-4	EtherSwitch Module (L2, 4-port GE)	NIM	●	●	●	●	●
NIM-ES2-8	EtherSwitch Module (L2, 8-port GE)	NIM	●	●	●	●	●
NIM-ES2-8-P	EtherSwitch Module (L2, 8-port GE/PoE+)	NIM	●	●	●	●	●
SM-X-ES3-16-P	SM-X EtherSwitch Module (L2/L3, 16-port GE/PoE+)	SM <sup>*1</sup>	-	●	●	-	●
SM-X-ES3-24-P	SM-X EtherSwitch Module (L2/L3, 24-port GE/PoE+)	SM <sup>*1</sup>	-	●	●	-	●
SM-X-ES3D-48-P	SM-X EtherSwitch Module (L2/L3, 48-port GE/PoE+)	SM <sup>*1</sup>	-	-	●	-	●
NIM-VAB-A	Multi Mode VDSL2/ADSL2/2+ (Annex A)	NIM	●	●	●	●	●
NIM-VA-B	Multi Mode VDSL2/ADSL2/2+ (Annex B)	NIM	●	●	●	●	●
NIM-VAB-M	Multi Mode VDSL2/ADSL2/2+ (Annex M)	NIM	●	●	●	●	●
NIM-1T	Serial WAN Module (1-port)	NIM	●	●	●	●	●
NIM-2T	Serial WAN Module (2-port)	NIM	●	●	●	●	●
NIM-4T	Serial WAN Module (4-port)	NIM	●	●	●	●	●
SM-X-1T3/E3	T3/E3 Module (1 port)	SM <sup>*1</sup>	-	●	●	-	●
NIM-1GE-CU-SFP	GE/SFP Module (1-port)	NIM	●	●	●	●	●
NIM-2GE-CU-SFP	GE/SFP Module (2-port)	NIM	●	●	●	●	●
SM-X-6X1G	GE/SFP Service Module (6-port)	SM-X	-	●	●	-	●
SM-X-4X1G-1X10G	GE/SFP (4-port) or SFP+ (1-port) Service Module	SM-X	-	●	●	-	●

## ■ Cisco UCS E Series Servers for Cisco ISR 1900/2900/3900/4000 Series

SKU	CPU Cores	Memory		Internal Drive Slots	RAID	Slot	Compatible Models													
		Default	Maximum				1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351
UCS-EN120E-54/K9	4	4 GB	4 GB	1	-	EHWC	●	●	-	●	●	●	●	●	●	●	-	-	-	-
UCS-EN120E-58/K9	4	8 GB	8 GB	1	-	EHWC	●	●	-	●	●	●	●	●	●	●	-	-	-	-
UCS-EN120E-108/K9	4	8 GB	8 GB	1	-	EHWC	●	●	-	●	●	●	●	●	●	●	-	-	-	-
UCS-EN120E-208/K9	4	8 GB	8 GB	1	-	EHWC	●	●	-	●	●	●	●	●	●	●	-	-	-	-
UCS-EN140N-M2/K9	4	8 GB	8 GB	1	-	NIM	-	-	-	-	-	-	-	-	-	-	●	●	●	●
UCS-EN120S-M2/K9	2	4 GB	16 GB	2	0/1	SM <sup>*1</sup>	-	-	-	-	●	●	●	●	●	●	-	●	●	-
UCS-E140S-M2/K9	4	8 GB	16 GB	2	0/1	SM <sup>*1</sup>	-	-	-	-	●	●	●	●	●	●	-	●	●	-
UCS-E160S-M3/K9 <span style="color:red">NEW</span>	6	8 GB	32 GB	2	0/1	SM <sup>*1</sup>	-	-	-	-	●	●	●	●	●	●	-	●	●	-
UCS-E160D-M2/K9	6	8 GB	96 GB	3	0/1/5	SM <sup>*1</sup>	-	-	-	-	-	-	●	●	●	●	-	-	●	-
UCS-E180D-M2/K9	8	8 GB	96 GB	3	0/1/5	SM <sup>*1</sup>	-	-	-	-	-	-	●	●	●	●	-	-	●	-

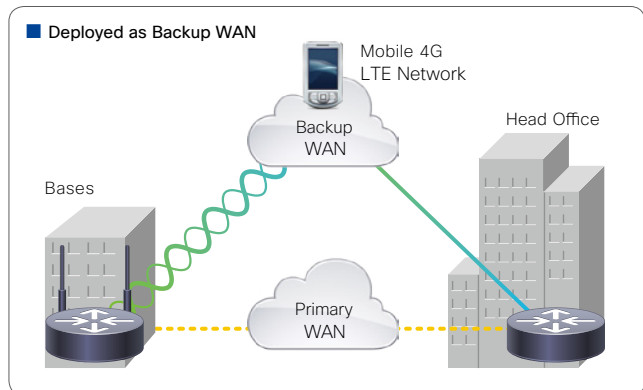
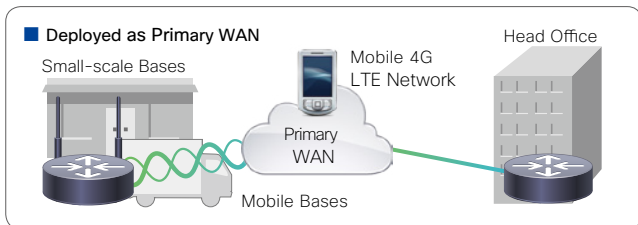
■ Extension Module for Cisco ISR 1900/2900/3900/4000 Series (2 of 2)

SKU	Description	Slot	Compatible Models																
			1921	1941	1941W	2901	2911	2921	2951	3925	3945	3925E	3945E	4321	4331	4351	4431	4451	
NIM-4G-LTE-GA	4G LTE Wireless WAN Module for Global	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4G-LTE-VZ	4G LTE Wireless WAN Module for Verizon	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4G-LTE-ST	4G LTE Wireless WAN Module for Sprint	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4G-LTE-NA	4G LTE Wireless WAN Module for North America	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2FXS	Voice Module (2-port FXS)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4FXS	Voice Module (4-port FXS)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2FXO	Voice Module (2-port FXO)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4FXO	Voice Module (4-port FXO)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2FXS/4FXO	Voice Module (2-port FXS and 4-port FXO)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4E/M	Voice Module (4-port E/M)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2BRI-NT/TE	Voice Module (2-port BRI)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4BRI-NT/TE	Voice Module (4-port BRI)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-1MFT-T1/E1	Voice/WAN Module (1-port T1/E1)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2MFT-T1/E1	Voice/WAN Module (2-port T1/E1)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-4MFT-T1/E1	Voice/WAN Module (4-port T1/E1)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-8MFT-T1/E1	Voice/WAN Module (8-port T1/E1)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-1CE1T1-PRI	Voice/WAN Module (1-port T1/E1/G.703)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-2CE1T1-PRI	Voice/WAN Module (2-port T1/E1/G.703)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
NIM-8CE1T1-PRI	Voice/WAN Module (8-port T1/E1/G.703)	NIM	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
PVDM4-32	High-density Voice DSP Module (16-channel)	PVDM4 <sup>*3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
PVDM4-64	High-density Voice DSP Module (32-channel)	PVDM4 <sup>*3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
PVDM4-128	High-density Voice DSP Module (64-channel)	PVDM4 <sup>*3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
PVDM4-256	High-density Voice DSP Module (128-channel)	PVDM4 <sup>*3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
PVDM4-64U128	Factory Upgrade from PVDM4-64 to PVDM4-128	PVDM4 <sup>*3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
PVDM4-64U256	Factory Upgrade from PVDM4-64 to PVDM4-256	PVDM4 <sup>*3</sup>	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
SM-X-PVDM-500	High-density Voice DSP Module (768-channel)	SM-X	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	●	●
SM-X-PVDM-1000	High-density Voice DSP Module (1,024-channel)	SM-X	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	●	●
SM-X-PVDM-2000	High-density Voice DSP Module (2,048-channel)	SM-X	-	-	-	-	-	-	-	-	-	-	-	-	-	● <sup>*4</sup>	-	●	●
SM-X-PVDM-3000	High-density Voice DSP Module (3,080-channel)	SM-X	-	-	-	-	-	-	-	-	-	-	-	-	-	● <sup>*4</sup>	-	●	●

\*1 SM-X slot is used for the Cisco ISR 4000 Series.

## 4G LTE Wireless WAN Solutions

Mobile 4G LTE networks can be deployed rapidly as primary or backup WAN by incorporating the **4G LTE Wireless WAN Module** on **Cisco ISR 1900/2900/3900/4000 Series**. Bandwidth can be utilized even more efficiently by using the module in combination with **Cisco Wide Area Application Services (WAAS)**.



\*1SM-X slot is used for the Cisco ISR 4000 Series.\*2Cisco ISR 1900 Series only supports data communications.\*3Also supported by a PVDM4 slot on Voice NIMs.  
\*4Supports up to 1,024 channels.



## Deploy Network Services in Minutes

Virtualizing traditional appliance-based network infrastructure functions – such as routing, firewalls, and WAN acceleration – lets you roll out new services and modify others right on the spot, even across widely dispersed locations. There's no need to add hardware for every function, and you can use automated, centralized provisioning and management to eliminate costly truck rolls.

### ■ Benefits

- Deploy or change network services in minutes across all your sites without truck rolls.
- Create multiple virtual branch offices at once.
- Reduce your number of network appliances, which saves CapEx, decreases management complexity, and shrinks real estate requirements.
- Protect your network infrastructure investment with Cisco ONE license portability while getting twice the value of a la carte licensing.

Cisco® Enterprise Network Functions Virtualization (NFV) converts your critical network functions into software, making it possible to deploy services in minutes. You can activate those network functions on the platform of your choice:

- Cisco Unified Computing System™ (Cisco UCS®) E-Series server module with the Cisco 4000 Series Integrated Services Routers (ISR)
- Cisco 5000 Enterprise Network Compute System (ENCS).

## What Makes It Possible: Solution Components

True NFV requires a single, fully integrated platform that can run on top of a diverse network of both virtual and physical devices. That's exactly what you get with Cisco Enterprise NFV. Our robust architecture includes four primary components: DNA-Center application; Cisco Enterprise Network Functions Virtualization Infrastructure Software (NFVIS); a growing list of available virtual network functions (VNFs); and a unified hardware host platform.

### ■ DNA-Center (see also page xxx)

The DNA-Center application automates your ability to deploy VNFs at multiple sites all at once using a convenient interface and pre-established templates. It also allows VNFs to intercommunicate with one another with no integration effort on your part. You can use DNA-Center to map a particular network configuration profile to sites within a region and populate each one with the common attributes they share. You can do this automatically across both virtual and physical branch sites. You get central, one-touch orchestration for your entire virtualized network, including third-party VNFs. DNA-Center offers a standardized site design, centralized provisioning, service chaining, lifecycle management, and automated monitoring of the Cisco Enterprise NFV solution.

### ■ NFVIS: Create Virtual Appliances

Enterprise NFVIS provides the Linux-based virtualization layer that allows you to easily add VNFs to your network. An integrated hypervisor lets you create and run network functions as virtual appliances using a graphical user interface. Programmable, open APIs allow enhanced applications, such as the ESA app described earlier, to work in the virtual branch. A Plug-and-Play (PnP) Application agent automatically connects to a central orchestrator in the DNA-Center, from which it downloads profiles to automatically set up WAN interface configuration details for a VNF and then lets the VNF boot right up with that configuration. Lifecycle management capabilities built into NFVIS also manage your VNFs and monitor their performance.

### ■ Transform Network Services into Software

For enterprises today, change is the only constant. And when innovations come fast, you need to be able to make quick changes to your network to keep up. Traditionally, adding new network services to your branch sites has often meant buying, installing, and testing a new "box" for each new function.

That equipment takes up valuable real estate and usually requires expensive truck rolls and special staffing to deploy and run it. The more locations you have, the more expensive and time-intensive it can get. But when you virtualize your network services with Cisco Enterprise NFV, these challenges disappear. You can deploy and manage your various services from a single, central platform. Which means no more truck rolls and physical staff needed to bring up a site. Now you have the stability you need to support your current business needs, and you'll be better prepared to take on whatever the future might bring.

### ■ VNFs: Virtual Versions of Traditional Network Functions

Cisco Enterprise NFV supports Cisco's best-in-class VNFs as well as non-Cisco VNFs. Cisco's robust services available with Enterprise NFV include Cisco routing (Integrated Services Virtual Router, or ISRv), Cisco firewall (ASA v), Cisco WAN acceleration (vWAAS), Cisco Firepower NGFW Virtual (NGFWv), and Cisco wireless LAN controller (vWLC) functions. Cisco ONE provides license portability from physical devices to software components, protecting your investment and creating the easiest path to virtualization.

### ■ Host Platforms: Your Choice

You have your choice of hardware upon which you can deploy Cisco Enterprise NFV. You can use a Cisco UCS E-Series server module with a 4000 Series ISR or the 5000 ENCS as your host platform today. Running multiple network infrastructure functions on a single box conserves budget by cutting back capital expenditures and reducing space requirements for housing equipment.

# Cisco 5000 Series Enterprise Network Compute System

## ■ Branch compute optimized for Enterprise NFV

Deploy network services in minutes. With the Cisco Enterprise Network Compute System, you can completely virtualize all your services in the branch, including routers. It provides service agility and density needed for the branch that has limited IT resources.

## ■ Hardware built for Enterprise NFV

The 5000 Series is a purpose-built compute platform optimized for Enterprise Network Functions Virtualization. Use Enterprise NFV to save time. Simplify operations and management. Make branch deployments faster and easier.

## ■ Open platform for Cisco and third parties

The 5000 Series features built-in LAN ports with up to 12 cores of compute. It includes complete lights-out capabilities and hardware acceleration for VM-to-VM traffic. It also supports legacy WAN transports and optional 4G LTE connectivity.



Cisco 5100 Enterprise Network Compute System - Front and Back



Cisco 5400 Enterprise Network Compute System - Front and Back

## ■ Cisco ISR 1000 Series Comparison

Technical Specifications	Cisco 5400 ENCS	Cisco 5100 ENCS
<b>CPU</b>	Intel Xeon Broadwell DE Processor D-1500 Family <ul style="list-style-type: none"> <li>● ENCS5412: Intel Xeon Processor D-1557 (12-core, 1.5 GHz, and 18 MB L2 cache)</li> <li>● ENCS5408: Intel Xeon Processor D-1548 (8-core, 2.0 GHz, and 12 MB L2 cache)</li> <li>● ENCS5406: Intel Xeon Processor D-1528 (6-core, 1.9 GHz, and 9 MB L2 cache)</li> </ul>	AMD Embedded R-Series SOC RX-421ND <ul style="list-style-type: none"> <li>● ENCS 5104: 4-core, 3.4 GHz, 2 MB L2 cache</li> </ul>
<b>DRAM</b>	<ul style="list-style-type: none"> <li>● 2 DIMM slots, each with 8, 16, or 32 GB ECC DDR4 RAM</li> <li>● 16 GB default single DIMM</li> <li>● 64 GB maximum system capacity</li> </ul>	<ul style="list-style-type: none"> <li>● 2 DIMM slots, each with 16 GB ECC DDR4 RAM</li> <li>● 16 GB default single DIMM</li> <li>● 32 GB maximum system capacity</li> </ul>
<b>Motherboard storage</b>	M.2 SATA - 64 GB (default), 200 GB, and 400 GB options	M.2 SATA - 64 GB (default), 200 GB, and 400 GB options
<b>Disk drives (SFF)</b>	Up to 2 Small Form Factor (SFF): <ul style="list-style-type: none"> <li>● 7200-rpm SATA: 1 TB, 2 TB</li> <li>● 10000-rpm SAS SED: 1.2 TB</li> <li>● 10000-rpm SAS: 1.8 TB</li> <li>● SATA SSD eMLC: 480 GB, 960 GB</li> </ul>	Not applicable
<b>RAID options</b>	Optional hardware LSI MegaRAID SAS 3108 Controller	Not applicable
<b>Total onboard WAN or LAN ports</b>	<ul style="list-style-type: none"> <li>● 2 GE WAN or LAN port (dual-mode RJ-45 and SFP)</li> <li>● Built-in 8-port GE LAN switch with PoE capability</li> <li>● GE management port for Intel x86 Host</li> </ul>	<ul style="list-style-type: none"> <li>● 2 GE WAN or LAN port (dual-mode RJ-45 and SFP)</li> <li>● 2 GE WAN or LAN port (RJ-45)</li> <li>● GE management port for Intel x86 Host</li> </ul>
<b>NIM slots</b>	1	Not applicable
<b>OIR (all I/O modules)</b>	Yes	Not applicable
<b>External USB 2.0 slots (type A)</b>	1	2
<b>Serial console port</b>	RJ-45 (up to 115.2 Kbps)	RJ-45 (up to 115.2 Kbps)
<b>Power-supply options</b>	Single, internal: AC and PoE PoE support is available on 5408 and 5412 Enterprise Network Compute System models only.	Single, internal: AC
<b>AC input voltage</b>	100 to 240 VAC auto-ranging	100 to 240 VAC auto-ranging
<b>Typical power (no modules) (Watts)</b>	125W	90W
<b>Total PoE budget</b>	A200W Platform supports Universal PoE (60W maximum per LAN port)	Not applicable
<b>Dimensions (H x W x D)</b>	1.73 x 17.25 x 13.3 in (includes power supply unit and NIM mounts) (4.4 x 43.8 x 33.8 cm)	1.73 x 12.7 x 10 in (4.4 x 32.3 x 25.4 cm)
<b>Rack height</b>	1 Rack Unit (1RU)	1 rack unit (1RU)

Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

Cisco Services

Programs & Promotions

## Can your WAN keep up?



### More users, more apps, different devices, but old network.

The Cloud Era has transformed Enterprise infrastructures in many ways. Explore how SD-WAN, powered by Cisco, can enable more secure, consistent and cost effective enterprise connections.

Cisco SD-WAN can help.

	Enterprise challenges	Cisco SD-WAN features	Benefits of migrating
<b>Cloud</b> 	<ul style="list-style-type: none"> <li>&gt;50% traffic in cloud, yet network is not cloud aware</li> <li>SaaS performs poorly</li> <li>Complex workflows for public cloud AWS/Azure</li> </ul>	<ul style="list-style-type: none"> <li>Single overlay that extends to data center, cloud and branch</li> <li>Dynamic optimization for O365 and other SaaS</li> </ul>	<ul style="list-style-type: none"> <li>Optimized for public cloud and SaaS</li> <li>4x improvement in SaaS response times</li> <li>Seamless connectivity to public cloud</li> </ul>
<b>Cost</b> 	<ul style="list-style-type: none"> <li>Prohibitive bandwidth costs at \$100/mbps</li> <li>Traffic grows 30% YoY</li> <li>Rigid architecture requires 6 - 9 months for simple policy change</li> </ul>	<ul style="list-style-type: none"> <li>Mix MPLS with low cost broadband/LTE</li> <li>Centralized management &amp; app visibility</li> </ul>	<ul style="list-style-type: none"> <li>&gt;50% drop in WAN costs</li> <li>Change control from six months to two days</li> </ul>
<b>Application Experience</b> 	<ul style="list-style-type: none"> <li>Application experience (SLA) is unpredictable</li> <li>70% of app outages are tied to networking problems</li> </ul>	<ul style="list-style-type: none"> <li>Active-active hybrid links</li> <li>App aware policies with real time enforcement</li> </ul>	<ul style="list-style-type: none"> <li>Predictable application SLA</li> <li>No app outages due to networking</li> </ul>
<b>Security</b> 	<ul style="list-style-type: none"> <li>Difficult to secure</li> <li>Critical enterprise assets, guest wireless, business partners</li> <li>Vulnerabilities in hybrid architectures</li> </ul>	<ul style="list-style-type: none"> <li>WAN segmentation with granular policies</li> <li>Auth + encryption + cloud security for hybrid networks</li> </ul>	<ul style="list-style-type: none"> <li>Isolation for critical enterprise assets, guest wireless, business partners</li> <li>Robust security for hybrid networks</li> </ul>

To learn more, visit: [cisco.com/go/sdwan](https://cisco.com/go/sdwan)



### Benefits of Cisco SD-WAN

- Better user experience
- Deploy applications in minutes, on any platform, with a consistent user experience and predictable app performance.
- Greater agility
- Set up and operate your WAN quickly and easily. Gain faster performance while consuming less bandwidth.
- Advanced threat protection
- Get protection from WAN edge to cloud with segmentation for critical assets and multilayer security that encrypts all data.

Find the right SD-WAN solution for you:

#### Cisco SD-WAN (Viptela)

From simple to sophisticated deployment scenarios, Cisco SD-WAN offers a cloud-first operational simplicity that covers a wide range of use cases.

#### Cisco Meraki

For lean IT teams, Cisco Meraki simplifies branch management and integrates threat management.

#### Cisco I WAN

For IT teams that want customization and open APIs, Cisco I WAN offers application hosting and virtualization.

## Cisco SD-WAN (Viptela): How it Works

Cisco SD-WAN built on the Cisco SD-WAN Fabric is a purpose-built solution from ground-up to provide secure, scalable, resilient WAN and with optimal user experience for applications for a Cloud-ready enterprise.



## Components of the Cisco SD-WAN solution



#### vManage

The vManage is a centralized dashboard that enables automatic configuration, management and monitoring of the Cisco SD-WAN overlay network. Users login to vManage to centrally manage all aspects of the network life cycle from initial deployment, on-going monitoring and troubleshooting to change control and software upgrades.



#### vSmart Controller

vSmart controllers are the brains of the overlay network. They establish secure SSL connections to all other components in the network, and run an Overlay Management Protocol (OMP) to exchange routing, security and policy information. The centralized policy engine in vSmart provides policy constructs to manipulate routing information, access control, segmentation, extranets and service chaining.



#### vEdge Router

The vEdge routers are full-featured IP routers that perform standard routing functions such as BGP, OSPF, ACLs, Qos and various routing policies in addition to the overlay communication. Each vEdge router establishes secure connectivity to all of the control components and also establishes IPSec sessions with other vEdge routers in the WAN network.



#### vBond Orchestrator

The vBond orchestrator facilitates the initial bring-up by performing initial authentication and authorization of all elements into the network. vBond provides the information on how each of the components connects to other components. It plays an important role in enabling Viptela devices that sit behind the NAT to communicate with the network.

## Key Principles

### ■ Transport independent secure fabric

Cisco SD-WAN solution builds an overlay fabric which is carrier agnostic as well as transport agnostic. Customers get a consistent WAN built on any transport like MPLS, Broadband, 4G/LTE, VSAT and more. Cisco SD-WAN solution secures connectivity over all of these transports to build a secure overlay network.

### ■ Separate of control-plane and data-plane

Cisco SD-WAN provides a clear separation between management-plane, control-plane and data-plane. This allows each component to work independently and efficiently. It also enables scaling of the different components based on the needs of the network.

### ■ Zero-Trust Security

Cisco SD-WAN is built based on the zero-trust model. All of the components mutually authenticate each other and all of the edge devices are authorized before they are allowed into the network. Every packet across data-plane, control-plane and management-plane that flows through the network is encrypted using SSL and IPSec technologies. Cisco SD-WAN solution has unique differentiated capabilities to build a large-scale IPSec network across tens of thousand of branches.

### ■ ZTP (Zero Touch Provisioning)

All of the vEdge routers are configured and managed using Zero Touch Provisioning. This allows customers to significantly reduce their operational expense in device activations and maintenance.

### ■ Cloud delivered

Cisco SD-WAN is Cloud delivered. All of the controllers are hosted in Cisco SD-WAN cloud and customers can login to the Viptela dashboard to centrally manage the WAN. Cisco SD-WAN vManage provides the ability to manage all aspects of the WAN from provisioning, monitoring and upgrading routers to application visibility and troubleshooting the WAN.

### ■ Routing & QoS

Cisco SD-WAN solution can be deployed in any brownfield or greenfield environments and is capable of running all OSPF and BGP routing protocols. These protocols can be enabled on the WAN side or the LAN side. In addition to the routing protocols, QoS can be enabled on any of the WAN and LAN ports. Migrating from MPLS to Hybrid.

### ■ Security and Segmentation

As more and more devices are internet connected and as new applications get rolled out in an enterprise branch, it becomes extremely critical for enterprises to isolate different types of traffic to avoid any threats coming out of different networks. Cisco SD-WAN provides fine-grained granular segmentation capabilities to segment various applications & users. For example, IT can create separate segments for Guest WiFi, PCI traffic, Business applications, Inventory applications, Video surveillance as well as voice calls.

### ■ Optimal user experience for IaaS and SaaS applications

Cisco SD-WAN solution provides various architecture models to enable optimal connectivity to IaaS and SaaS applications.

For public clouds, Cisco SD-WAN vEdge-Cloud is available in the Amazon AWS as well as Microsoft Azure market place. Customers can deploy vEdge-Cloud in these clouds to extend the WAN all the way to where the applications are deployed. Consistent policy control, visibility to application usage and securing the traffic all the way to the applications are some of the advantages of deploying vEdge-cloud closer to the application.

For SaaS applications, Cisco SD-WAN solution can monitor connectivity to various SaaS applications and ensure that all traffic to the SaaS applications is following the most optimal path.

### ■ Open Architecture with flexibility of management interfaces

Cisco SD-WAN truly believes in open architecture and provides flexibility and choice to end customers to effectively manage the WAN network. For management interfaces, the solution supports REST APIs, SNMP, Netconf, Syslog as well as IPFIX interfaces.

### ■ Advanced Analytics

Cisco SD-WAN vAnalytics provides deep insight into the operations of the wide area network including visibility into network operations and application visibility and availability. In addition, customers can run through various What-If scenarios and fine tune their network based on the recommendations.

# Cisco Wide Area Application Services (WAAS)

## What is Cisco WAAS?

**Cisco Wide Area Application Services (WAAS)** is an effective solution for achieving optimization of inter-office WAN and application acceleration. This solution addresses the WAN-specific issues such as delays to enhance the TCP-based application performance.

### ■ Same Level of Application Performance as LAN Connection

Cisco WAAS enables applications to be used via WAN with the same level of performance as via LAN.

- **Optimized throughput:** Enhances the WAN environment even further by improving the behavior of the transport protocol.
- **More efficient bandwidth:** Minimizes the sending/receiving of redundant data patterns using DRE (Data Redundancy Elimination) and compression technology.
- **Application speedup:** Achieves efficient utilization of bandwidth by eliminating delays using technologies such as read-ahead, protocol proxy and caching.

### ■ Full Support for Citrix XenDesktop and XenApp

VDI (Virtual Desktop Infrastructure) solutions that are becoming increasingly popular to address the challenges in the fields of business flexibility and sustainability as well as compliance/security requirements. However, since the communications from a client to a virtual desktop (i.e. server) are achieved via a network, network delay and bandwidth limit need to be considered carefully (especially via WAN).

Cisco WAAS has obtained Citrix's compatibility certification for their VDI solutions Citrix XenDesktop and XenApp and delivers the following benefits.

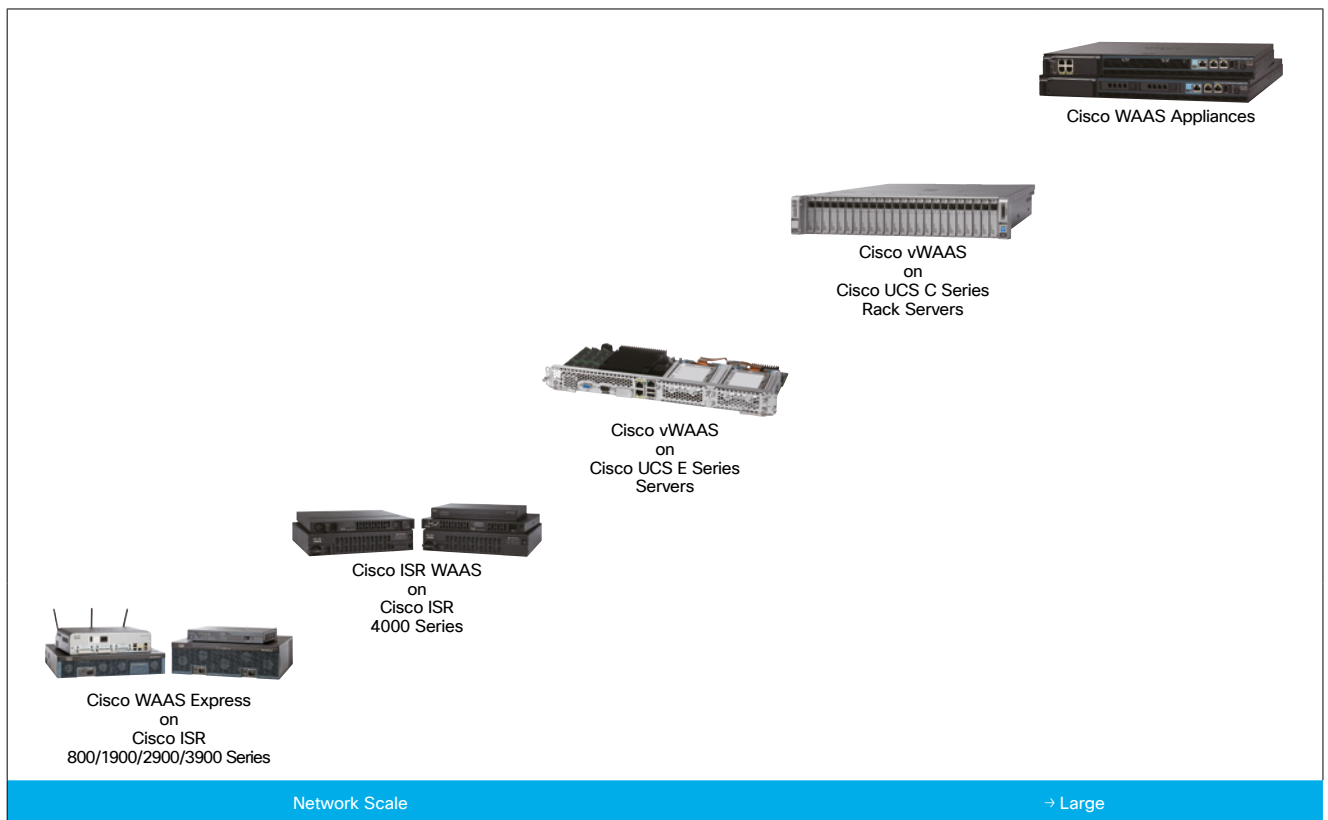
- Enhances the virtual desktop performance on WAN by up to 70 %
- Increases the number of simultaneous Citrix client connections by up to twice without the costly upgrade of the WAN bandwidth.
- Up to 60 % reduction of the WAN bandwidth requirements
- Up to 98 % optimization of the printing via WAN
- Supports Citrix MSI (Multi Stream ICA)

For details on **Cisco WAAS**, visit the following Web site:

 [www.cisco.com/go/waas](http://www.cisco.com/go/waas)

## Cisco WAAS Product Portfolio

Cisco WAAS is available in various types to suit different purposes and scales. These products can be used to achieve WAN optimization and application acceleration in a variety of operating environments, resulting in enhanced corporate productivity.



### Cisco WAAS Express

Software products suitable for bases, integrated into Cisco IOS on the Cisco ISR 800/1900/2900/3900 Series, and activated by Cisco IOS Feature License or Cisco IOS APP license.

### Cisco ISR WAAS

Software products suitable for bases or data centers/headquarters, integrated into Cisco IOS XE on the Cisco ISR 4000 Series, and activated by Cisco IOS APP License.

### Cisco vWAAS

Software products suitable for bases or data centers/headquarters, implemented on VMware ESX/ESXi which is supported by Cisco UCS E Series Servers and Cisco UCS C Series Rack Servers.

### Cisco WAAS Appliances

Hardware appliances suitable for bases or data centers/headquarters.



# Application Optimization with Akamai Connect

Cisco WAAS with Akamai Connect provides a suite of integrated WAN optimization, application acceleration, and intelligent caching features in Cisco ISR 4000 running Application Experience services.

The solution extends the well-known Akamai Intelligent Platform with HTTP/HTTPS caching across the last mile into the branch office, turbo charging the application optimization features of the Cisco WAAS. Akamai Connect caching integrates with Cisco IWAN features such as Application Visibility and Control (AVC), Cisco Performance Routing (PfR), and Cisco Wide Area Application Services (WAAS). It is available across the Cisco ISR portfolio and Cisco WAAS Appliances, allowing you to deploy full-service branch-office operations.

Users can access bandwidth-intensive applications instantly, over any network, regardless of where the application is hosted - data center, private cloud, public cloud, or the Internet.

Cisco WAAS and Akamai connect can be purchased a-la-carte (see table on the right) or if you choose Cisco ONE Software suites it is already an integral part.

## Mobile Assisted Selling Application Benchmark Results in Seconds (s)

	Without Akamai Connect	With Akamai Connect 1st Hit	With Akamai Connect 2nd Hit
ERP App	57 s	18 s	2 s
Repair App	70 s	28 s	< 1 s
Catalog App	28 s	13 s	< 1 s

## Training/Digital Signage Application Benchmark Results in Pixels (p) and Seconds (s)

	Without Akamai Connect	With Akamai Connect
Default Quality	144 p	720 p (HD Automatic)
Time to Load (720 p HD)	14 s	Instant

## Cisco IWAN with Akamai Connect License

SKU	Description
SL-200-AKC	License for up to 200 WAAS connections
SL-750-AKC	License for up to 750 WAAS connections
SL-1300-AKC	License for up to 1300 WAAS connections
SL-2500-AKC	License for up to 2500 WAAS connections
SL-6K-AKC	License for up to 6000 WAAS connections

## Cisco WAAS Specification Comparison

Series Name	SKU/Platform	WAN Bandwidth (Max)	TCP Optimized Connections (Max)	WAN Optimization	App Speedup	AppNav	Central Manager Mode Managed Devices
Cisco WAAS Express	L-FL-C880-WAASX <sup>*1</sup>	1.5 Mbps	75	●	-	-	-
	L-FL-C890-WAASX <sup>*1</sup>	2 Mbps	75	●	-	-	-
	L-FL-C1941-WAASX <sup>*1</sup>	4 Mbps	150	●	-	-	-
	L-FL-C2901-WAASX <sup>*1</sup>	6 Mbps	150	●	-	-	-
	L-FL-C2911-WAASX <sup>*1</sup>	6 Mbps	200	●	-	-	-
	L-FL-C2921-WAASX <sup>*1</sup>	6 Mbps	200	●	-	-	-
	L-FL-C2951-WAASX <sup>*1</sup>	6 Mbps	200	●	-	-	-
	L-FL-C3900-WAASX <sup>*1</sup>	10 Mbps	500	●	-	-	-
Cisco ISR WAAS	Cisco 4321	15 Mbps	200	●	●	●	-
	Cisco 4331	25 Mbps	750	●	●	●	-
	Cisco 4351	25 Mbps	750	●	●	●	-
	Cisco 4431	50 Mbps	1,300	●	●	●	-
	Cisco 4451	150 Mbps	2,500	●	●	●	-
Cisco vWAAS	LIC-200-VWAAS	20 Mbps	200	●	●	-	-
	LIC-750-VWAAS	50 Mbps	750	●	●	-	-
	LIC-1300-VWAAS	80 Mbps	1,300	●	●	-	-
	LIC-2500-VWAAS	150 Mbps	2,500	●	●	-	-
	LIC-6K-VWAAS	200 Mbps	6,000	●	●	-	-
	LIC-12K-VWAAS	310 Mbps	12,000	●	●	-	-
Cisco WAAS Appliances	WAVE-294-K9	4 GB Memory	10 Mbps	200	●	●	250 (200) <sup>*7</sup> <sub>*8</sub>
		8 GB Memory <sup>*2</sup>	20 Mbps	400	●	●	250 (200) <sup>*7</sup> <sub>*8</sub>
	WAVE-594-K9	8 GB Memory	50 Mbps	750	●	●	1,000 (800) <sup>*7</sup> <sub>*8</sub>
		12 GB Memory <sup>*3</sup>	100 Mbps	1,300	●	●	1,000 (800) <sup>*7</sup> <sub>*8</sub>
	WAVE-694-K9	16 GB Memory	200 Mbps	2,500	●	●	2,000 (2,000) <sup>*7</sup> <sub>*8</sub>
		24 GB Memory <sup>*4</sup>	200 Mbps	6,000	●	●	2,000 (2,000) <sup>*7</sup> <sub>*8</sub>

## Modules for Cisco Wide Area Application Services (WAAS) Appliance

SKU	Description	GE Ports	SFP Ports
WAVE-INLN-GE-4T	GE Module for the Cisco WAAS Appliances <sup>*9</sup>	4	-
WAVE-INLN-GE-8T	GE Module for the Cisco WAAS Appliances	8	-
WAVE-INLN-GE-4SX	SFP Module for the Cisco WAAS Appliances	-	4
WAVE-APNV-GE-12T	AppNav GE Module for the Cisco WAVE 694 WAAS Appliances	12	-
WAVE-APNV-GE-12SFP	AppNav SFP Module for the Cisco WAVE 694 WAAS Appliances	-	12

\*1 Maximum DRAM supported by the platform is required. \*2 MEM-294-8GB is required. \*3 MEM-594-12GB is required. \*4 MEM-694-24GB is required.

\*5 Cisco AppNav 10 GE Bundle (WAVE-APNV-10GE) is required. \*6 Cisco AppNav GE or SFP Module is required. \*7 Performance indicators based on Cisco WAAS software release 5.1.

\*8 The maximum number of managed devices is reduced by 20% in an environment containing routers equipped with Cisco WAAS Express. \*9 Incorporated on WAVE-294-K9 by default.



# Security

## Cisco Network Security as Architected Solutions

### Introduction

Cisco network-security solutions continue to evolve and expand to mitigate the growing security threats all organisations face. The latest Architected solution illustrated below moves on from NaaS and NaaSE to provide enhanced Network (Security) Visibility and Enforcement leveraging:

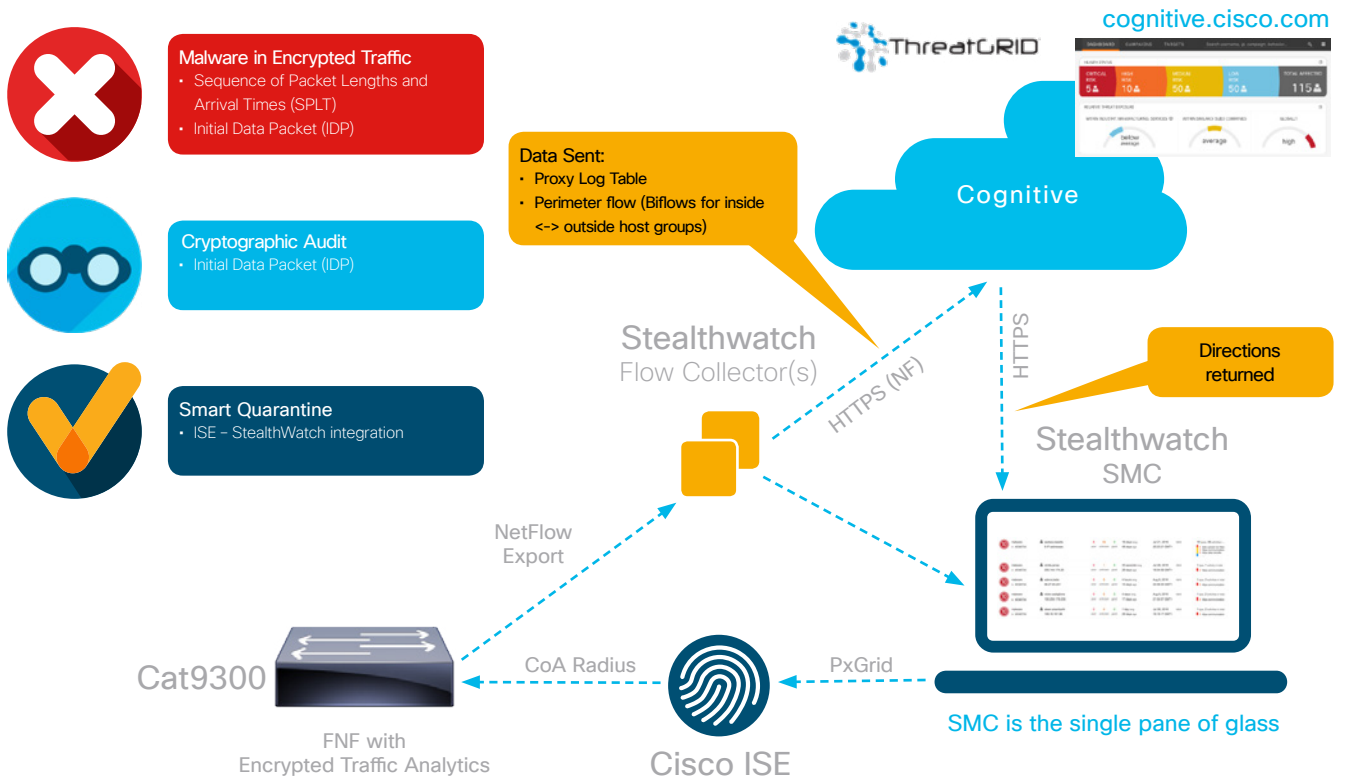
1. Established leadership in network security telemetry (line rate full flow Flexible Netflow on Catalyst switches)
2. Telemetry now extended to provide collection of new data elements that provide more insight into encrypted traffic (available first on Catalyst 9300)
3. StealthWatch integration with Cognitive to utilise global threat feeds and cloud based analytics.

#### Network Security Architecture

4. StealthWatch integration with ISE. To provide rich context and group based policy control e.g smart quarantine using TrustSec groups (SGT)

This solution can detect malware and malicious activity in encrypted traffic without decrypting. It can inform security operations of such an event, allowing Ops to perform a “one click” or automatic smart quarantine of an affected device. For example it could change a security group (SGT) to restrict access to critical resource until the operator is confident the incident is successfully resolved and allow reversion to normal” access rights.

### Network Security Solution Architecture



### More on Encrypted Traffic Analytics (ETA)

Encrypted Traffic Analytics (ETA) can detect and provide insight into encrypted threats without compromising privacy and security by decrypting data within the network.

Traditional flow monitoring provides a high-level view of network communications by reporting the addresses, ports and byte and packet counts of a flow. In addition, intraflow metadata, or information about events that occur inside of a flow, can be collected, stored and analyzed within a flow monitoring framework. This data is especially valuable when traffic is encrypted, because deep-packet inspection is not viable. This intraflow metadata, called Encrypted

Traffic Analytics, is derived by using new types of data elements and telemetry, such as the lengths and arrival times of messages within a flow. These data elements apply equally well to both encrypted and unencrypted examples of malicious flows.

Using these data elements or intraflow telemetry to identify malware communication in encrypted traffic means Encrypted Traffic Analytics can maintain the integrity of the encrypted flow without the need for bulk decryption (Figure 2 and Table lists the benefits of using Encrypted Traffic Analytics).

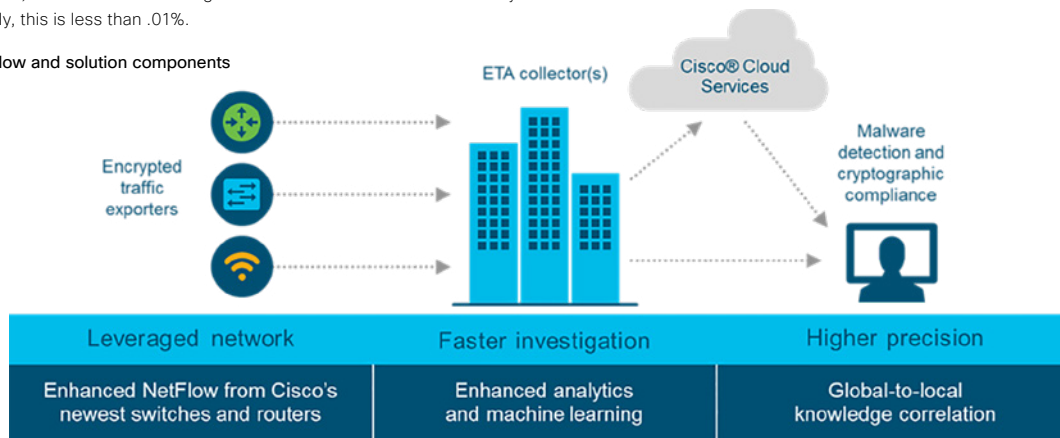
# Cisco Encrypted Traffic Analytics (ETA)

A key component of Cisco Network Visibility and Enforcement and Stealthwatch application. We have enhanced capability to use the network as a sensor capabilities to detect malicious patterns in not only non-encrypted traffic but also in encrypted traffic. And without performing decryption of the encrypted traffic.

Cisco ETA using a combination of network contextual data and our Talos threat intelligence database, we are able to identify malware in encrypted traffic. We do this by inference using multiple sources of data, there is no decryption of inspection of traffic content – privacy is maintained at all times. With a high accuracy rate of 99.99%. Also important to cyber security professionals is the false positive rate, or the times something is identified as malware and it actually is not. Incredibly, this is less than .01%.



## ETA Traffic flow and solution components



# ETA Components

## Flexible Netflow

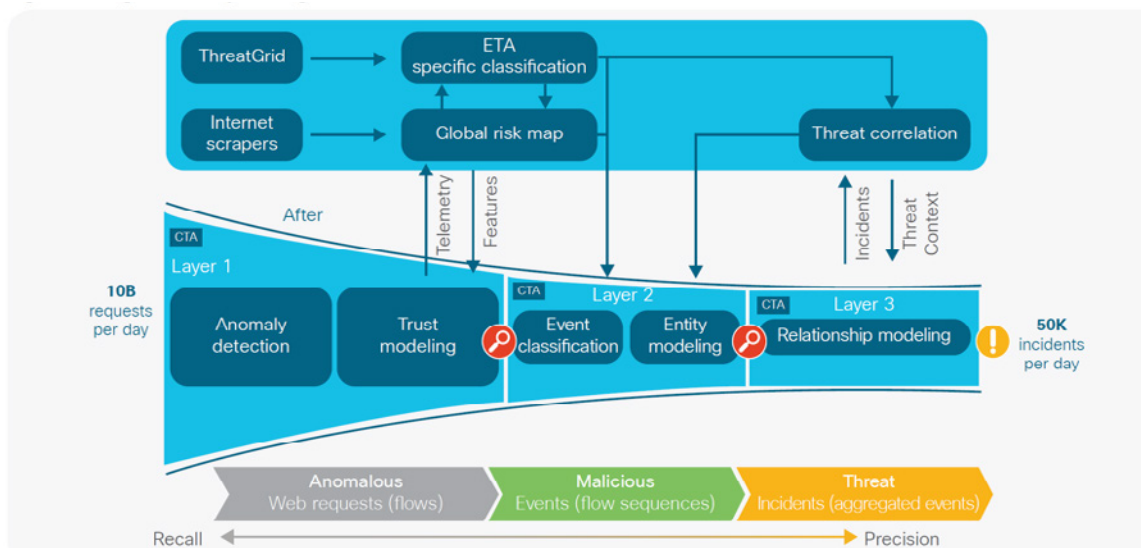
In the NetFlow architecture, data is transmitted from exporter to collector in sets of records. Each record in a data set has the same format, which is specified by its template. The data record consists of a series of NetFlow information elements or "fields," and a specific ID value is assigned to each field. The ID values for information elements may be globally defined and archived by the Internet Assigned Numbers Authority (IANA), or they may be enterprise specific and defined by individual organizations.

## Stealthwatch with Cognitive Analytics

Cisco Stealthwatch uses NetFlow, proxy servers, endpoint telemetry, policy and access engines, traffic segmentation and more to establish baseline "normal" behavior for hosts and users across the enterprise. With the integration of Cognitive Analytics, a cloud-based analysis engine, Stealthwatch can correlate traffic with global threat behaviors to automatically identify infected hosts, command and control communication and suspicious traffic.

Cognitive Analytics maintains a global risk map – a very broad behavioral profile about servers on the Internet, identifying servers that are related to attacks, may be exploited, or may be used as a part of an attack in the future (figure 3). This is not a blacklist, but a holistic picture from a security perspective. Cognitive Analytics analyzes the new encrypted traffic data elements in enhanced NetFlow by applying machine learning and statistical modeling. The global risk map and Encrypted Traffic Analytics data elements reinforce each other in the Cognitive Analytics engine. Rather than decrypting the traffic, Stealthwatch with Cognitive Analytics uses machine learning algorithms to pinpoint malicious patterns in encrypted traffic to help identify threats and improve incident response.

The Security Insight dashboard on the Stealthwatch Management Console (SMC) provides a view of affected users identified by Cognitive Analytics by risk type. An expanded Cognitive Analytics dashboard provides detailed information regarding the top risk escalations and relative threat exposure. Table 3 lists some high-risk threats that use encrypted command and control communications.

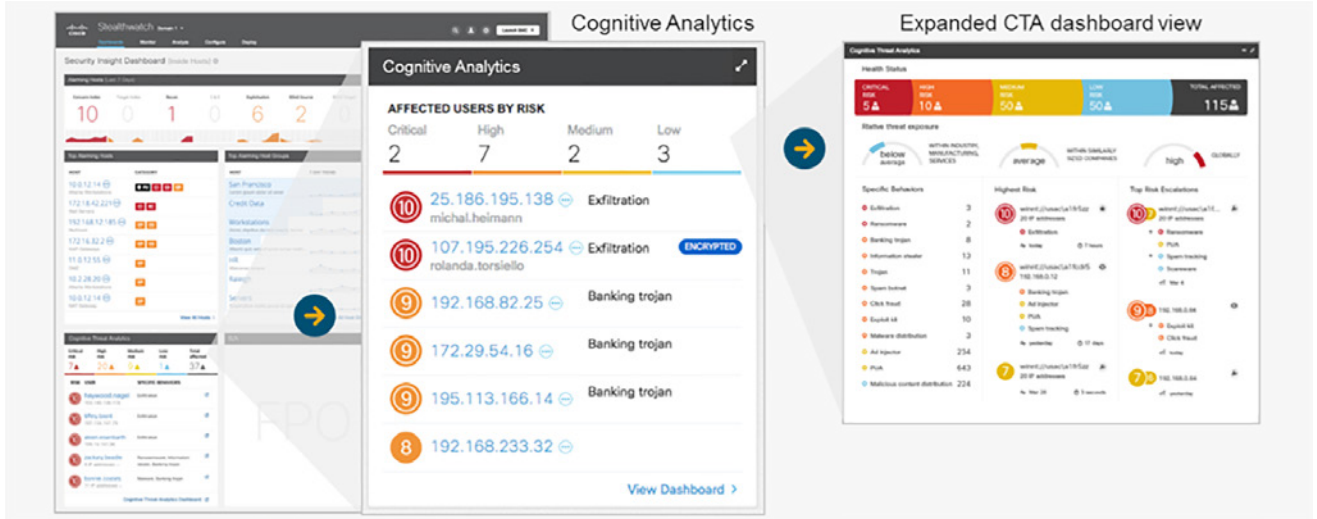


- Switches
- Wireless
- Routing
- Security
- Cisco Meraki
- DNA-Center
- SMB
- Software
- Financing
- Cisco Services
- Programs & Promotions

■ **ETA Traffic flow and solution components**

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■ **Feature Support**

Cisco’s newest networking equipment, starting with Cisco IOS® XE 16.6, will support an enhanced NetFlow with Encrypted Traffic Analytics capability.

Compatible Cisco equipment supporting enhanced NetFlow with Encrypted Traffic Analytics: Switches: Cisco Catalyst® 9300 Series (starting with the Cisco IOS XE 16.6 release) and the 9400 Series and 9500 Series (starting with the Cisco IOS XE 16.8.1 release)

Routers: ASR 1001-X, ASR 1002-X, ASR 1001-HX, ASR 1002-HX, ASR 1004, ASR 1006-X, ASR 1009-X, 4221 ISR, 4321 ISR, 4331 ISR, 4351 ISR, 4431 ISR, 4451-X ISR, Integrated Services Virtual Router (ISRv) including the 5400 Enterprise Network Compute System, Cloud Services Router (CSR) 1000V (starting with the Cisco IOS XE 16.7 release)

Stealthwatch gains additional machine learning and statistical modeling capabilities (in release 6.9.2) to analyze enhanced NetFlow with Encrypted Traffic Analytics.

Stealthwatch Learning Network License (v2.0) on routers gains the ability to build behavioural profiles of the encrypted traffic, enabling it to flag anomalies detected in encrypted traffic.

■ **Benefits**

**Encrypted traffic analytics** - Pinpoint malicious patterns in encrypted traffic. Compromised host detection speeds incident response.

**Advanced threat detection** - Detect threats that have bypassed existing security controls. Identify insiders exfiltrating data to legitimate cloud services.

**Extended visibility and behavioural analytics** - Obtain additional visibility and context into global and local traffic. Use machine learning for continuous analysis and detection of command and control communications.

■ **Conclusion**

In summary, the network is now an even more advanced security sensor, capable of detecting threats in encrypted traffic. A Cisco Digital Network Architecture-ready infrastructure turns the network into an end-to-end sensor and enforcer that detects, contains and prevents emerging, sophisticated security threats.

## ISE Update - whats new in ISE 2.3?

■ **ISE helps enable the Cisco Software-Defined Access architecture**

Now you can manage and automate your network - including policy and access - from a single dashboard with Cisco DNA Center. **DNA Center** is a holistic, end-to-end network management platform for the **Network. Intuitive**. Integrating ISE allows the DNA Center to define and enact policy to control access across the network, all from a unified interface. Cisco ISE 2.3 is a required integration component for the DNA Center and SD-Access.

■ **Features**

The need for robust access control that scales has never been greater. Rich visibility into who and what are on your network along with the ability to segment end-to-end using a software-defined approach are critical requirements of customers who are seeing an explosion of connected devices as well as a perpetual deluge of network breaches. Which is why the latest version of **Cisco ISE** doubles-down on outcomes that realize a **secure digital network**. It does this through enabling automation, administrative simplification, and net new capabilities.

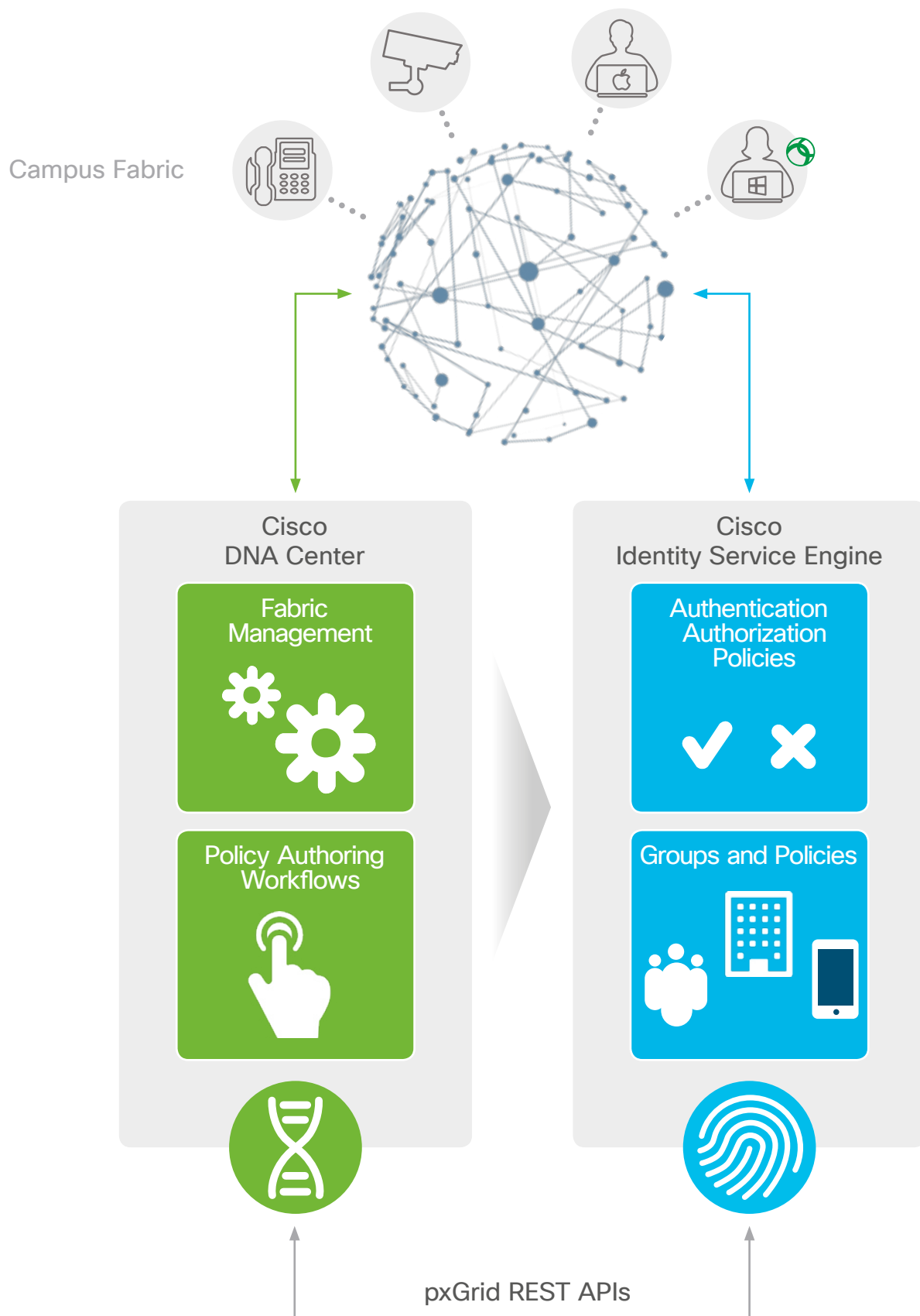
ISE 2.3 offers DNA Center integration, new policy UI, enhanced posture, and guest network login using Facebook credentials, read-only access, ACS parity features, an Upgrade Readiness Tool and more! For additional details, see the on [www.cisco.com/go/ISE](http://www.cisco.com/go/ISE) to find latest resources and release notes.

■ **Conclusion**

The network infrastructure is everywhere and sees everything. Cisco Network based security features can be integrated with our specialist security products and threat intelligence using a Cisco Digital Network Architecture to turn the network into a security sensor and enforcer that provides advanced network security visibility and enforcement NVE.

This infrastructure can then detect, contain and prevent emerging and sophisticated security threats. And is uniquely, capable of detecting those threats in encrypted traffic without the risk and processing overhead of in network decryption.

# ISE and DNA-C Integration for Policy Automation



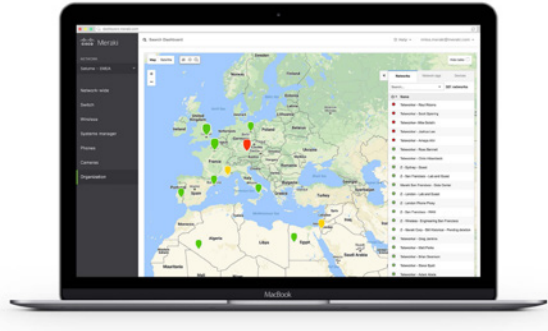
Switches
Wireless
Routing
Security
Cisco Meraki
DNA-Center
SMB
Software
Financing
Cisco Services
Programs & Promotions



# Cisco Meraki

## Simply Better IT

The **Cisco Meraki** portfolio is centrally managed from an intuitive web-interface. This feature-rich, easy-to-use dashboard enables customers to reduce operating costs and rapidly implement IT initiatives to achieve their organization's mission.



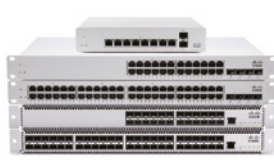
- Manage your IT infrastructure from a single dashboard
- No controller hardware or management software to install and maintain
- Bring sites live in a matter of days with zero-touch provisioning
- Isolate and fix issues in minutes with built-in remote troubleshooting tools
- Gain insight with out-of-the-box Layer-7 visibility and location analytics
- Stay protected and up-to-date with seamless over-the-web firmware and security updates
- Satisfy unique and advanced use cases through open APIs
- Secure (PCI and HIPAA-compliant) cloud infrastructure

## Cisco Meraki Cloud Managed IT Portfolio



### ■ Cloud Managed Wireless (MR)

- Indoor and outdoor access point models
- IEEE 802.11ac and 802.11n with ultra-high performance, up to 2.5 Gbps
- Integrated wireless security and guest access
- Third radio dedicated to security and RF optimization (indoor models)
- Ideal for high-density campuses, branches, teleworkers, and rugged/outdoor environments
- Built-in traffic shaping, location analytics, group policies—all configurable with just a few mouse clicks



### ■ Cloud Managed Switches (MS)

- GE access switches and 40 GE aggregation switches
- Centrally managed with monitoring and alerts
- Ultra reliable and includes lifetime warranty
- Optimized for voice and video traffic with PoE+ available on all ports



### ■ Cloud Managed Security Appliances (MX)

- Complete networking, security, and application control
- Centrally managed from the cloud
- Includes firewall, auto VPN, WAN optimization, and branch routing
- Six models scale from small branches to campuses
- AMP **NEW**



### ■ Mobility Management (SM)

- Network-wide visibility and control
- No on-site controller hardware
- Automatic monitoring and alerts
- Seamless over-the-web upgrades



### ■ Cloud-Managed Security Cameras (MV) **NEW**

- Arrange video tiles on the fly for monitoring of key areas
- The Cisco Meraki dashboard provides secure monitoring and management of all your cameras from anywhere in the world.
- Laptop gone missing? Easily identify where it went and export a video clip to share with law enforcement.
- IR illumination allows for video recording in dark environments up to 30m
- Easily define who can see which video streams, view historical footage, and export video, all from the dashboard.
- The MV21 provides drastically simplified industrial design, eliminating the need for tools when re-adjusting the lens

For details on **Cisco Meraki**, visit the following Web site:

 [www.cisco.com/go/meraki](http://www.cisco.com/go/meraki)

REDUCING **TOTAL COST OF OWNERSHIP** WITH CISCO MERAKI

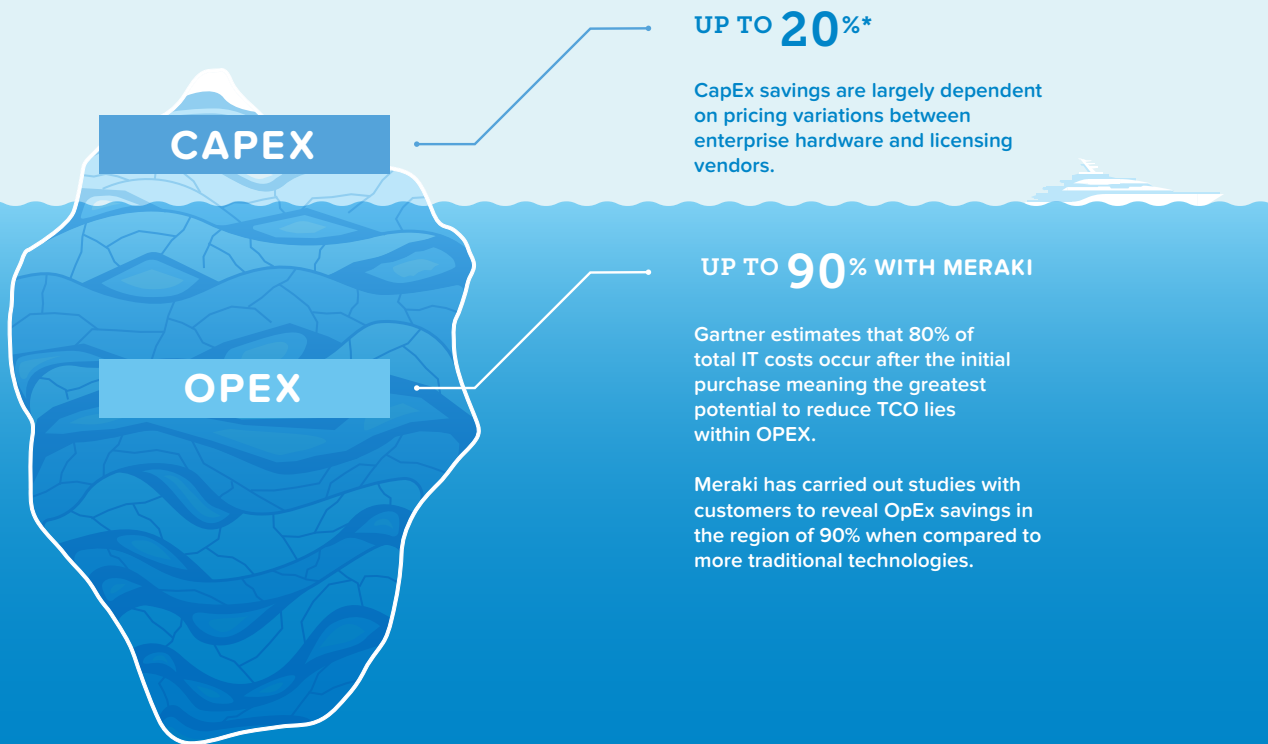
**TCO = CAPEX + OPEX**

TOTAL COST OF OWNERSHIP

CAPITAL EXPENDITURE

OPERATIONAL EXPENDITURE

**Potential Savings**



**Use Cases**

■ Features Most Used by Our Customers

	Retail	Education	Corporate Office
<b>MX Security</b> 	Site-to-Site VPN	Content Filtering	IPS with Sourcefire Advanced Malware Protection (AMP)
<b>MS Switching</b> 	Cloning Configurations	Virtual Stacking	Layer 3 and Redundancy
<b>MR Wireless</b> 	Cloud CMX Analytics	High-Density WiFi	BYOD Policies
<b>SM Mobility</b> 	Tablet Management	Application Management	Security Policy Enforcement

- Switches
- Wireless
- Routing
- Security
- Cisco Meraki
- DNA-Center
- SMB
- Software
- Financing
- Cisco Services
- Programs & Promotions

## CASE STUDIES

### RETAIL

A Wireless



Verizon authorized retailer



Deployed Meraki security appliance + wireless and switches at **670 stores** with **500 more planned**



**MERAKI** 6  
**TRADITIONAL** 1

SIX MERAKI STORES CAN BE BROUGHT LIVE FOR COST OF ONE, USING TRADITIONAL TECHNOLOGY

SAVINGS WITH MERAKI OVER 3 YEARS

**OPEX** 97%  
**TCO** 83%

COMPARED TO TRADITIONAL TECHNOLOGY

### MANUFACTURING

Bar S Foods



Largest food packing company in North America by volume



**14** distribution centers, **5** production sites, **1** warehouse, **1** HQ

**\$5.25 MILLION**  
PRODUCTION REVENUE SAVED WITH MERAKI OVER 5 YEARS

**525 HOURS**  
CUMULATIVE HOURS SAVED WITH MERAKI OVER 5 YEARS

SAVINGS WITH MERAKI OVER 5 YEARS

**OPEX** 99%  
**TCO** 87%

COMPARED TO TRADITIONAL TECHNOLOGY

### HEALTHCARE

Center for Neurosciences, Orthopaedics & Spine



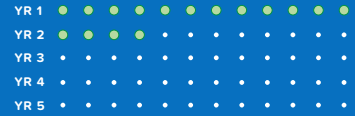
Healthcare organization specializing in Neurosciences, Orthopaedics & Spine



Utilize full stack of Meraki devices across **17 hospitals** and satellite clinics

**15% MORE**

CAPEX COST WITH MERAKI VERSUS TRADITIONAL TECHNOLOGY



**1 YEAR AND 4 MONTHS**

THE TIME TO RECOVER THE DIFFERENCE IN CAPEX WITH MERAKI OVER 5 YEARS

SAVINGS WITH MERAKI OVER 5 YEARS

**OPEX** 90%  
**TCO** 26%

COMPARED TO TRADITIONAL TECHNOLOGY

Learn more about Meraki at [meraki.cisco.com](https://meraki.cisco.com)

\*Based on research on the price difference between the highest performing wireless access points amongst enterprise networking vendors.



## What's new in Meraki Systems Manager

### More power. More choice. More protection.

Systems Manager adds more protection for mission critical devices and another platform to its solution for unified endpoint management.

#### Do Not Disturb

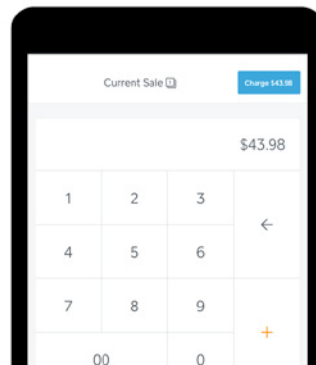
Don't push settings during Do Not Disturb

- Point of Sale devices don't receive app & profile updates during business hours
- Students don't receive app updates during class
- Only push OS updates after hours

#### Support for Apple TV

Manage and configure Apple TV

- Out-of-the-box enrollment with DEP
- Push settings including WiFi
- Unified management of mobile, PCs, and Apple TV



# Cisco Meraki MX and SD-WAN with AMP

Cisco Meraki MX Cloud Managed Security Appliance Series are ideal for organizations with large numbers of distributed sites. Since the MX is 100% cloud managed, installation and remote management is simple. The MX has a comprehensive suite of network services, eliminating the need for multiple appliances. These services include Layer 7 application firewall, content filtering, web search filtering, intrusion prevention, web caching, Intelligent WAN with multiple uplinks and 4G failover.

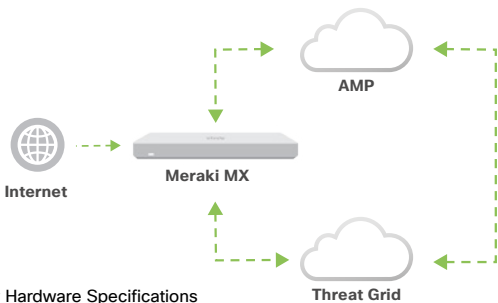
### ■ Cisco Meraki AMP

#### Advanced Malware Protection (AMP)

Advanced Malware Protection (AMP) is an industry-leading anti-malware technology from SourceFIRE, integrated into MX Security Appliances

#### How does it work?

With AMP, a world class malware database is paired with context-aware monitoring and reporting, retrospective malware analysis, and Threat Grid sandboxing to provide an anti-malware solution that does more than just prevent users from downloading malware – it provides comprehensive security before, during, and after a malware attack.



### ■ Key Hardware Specifications

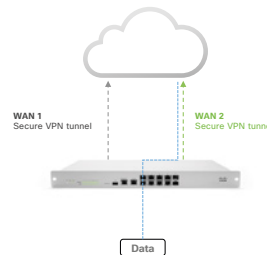
	MX64	MX65	MX84	MX100	MX400	MX600
Recommended Users	50	50	200	500	2,000	10,000
Firewall (Mbps)	250	250	500	750	1,000	1,000
Advanced Security (Mbps)	200	200	300	650	1,000	1,000
Max VPN Peers	25	25	100	250	1,000	5,000
Dual WAN Links	●	●	●	●	●	●
Web Caching	-	-	●	●	●	●
Web Cache Size (TB)	-	-	1	1	1	4
Fiber Connectivity	-	-	-	SFP	SFP+	SFP+
Dual Power Supply	-	-	-	-	●	●



### ■ SD-WAN

#### What is SD-WAN?

Software-defined WAN (SD-WAN) is a suite of features designed to allow the network to dynamically adjust to changing WAN conditions without the need for manual intervention by the network administrator. By providing granular control over how certain traffic types respond to changes in WAN availability and performance, SD-WAN can ensure optimal performance for critical applications and help to avoid disruptions of highly performance-sensitive traffic, such as VoIP.



### ■ License Editions

	Enterprise	Advanced Security
Stateful Firewall, NAT, DMZ	●	●
Active/Passive HA	●	●
Layer 7 Traffic Shaping	●	●
Cloud-based Management	●	●
Monitoring and Alerts	●	●
Link Aggregation and Failover	●	●
Web Caching	●	●
Site-to-Site and Client VPN	●	●
Client VPN	●	●
SD-WAN	●	●
3G/4G Failover	●	●
IDS/IPS	-	●
Content Filtering with SafeSearch	-	●
Anti-Virus and Anti-Phishing	-	●
Geo-IP Firewall Rules	-	●
AMP	-	●

# Z3: Fast, Reliable Connectivity for the Modern Teleworker

### ■ Hardware

802.11ac Wave 2 WiFi for fast and reliable connectivity  
 4 wired ports with one PoE-powered port, ideal for phones  
 1 GbE WAN port, 4 GbE LAN ports  
 3G / 4G failover via USB modem  
 Sleek, low profile design with optional desk stand

### ■ Wireless

Dual-band 802.11ac Wave 2 radios  
 2x2 MU-MIMO, up to 1.3 Gbps data rate  
 Supports up to 4 SSIDs

### ■ Traffic shaping and application management

Layer 7 application visibility and traffic shaping  
 Application prioritization

### ■ Teleworker gateway services

Stateful firewall separates corporate and personal traffic  
 Extend VoIP phones over WAN  
 802.1x support for wired port authentication  
 Auto VPN™ self-configuring site-to-site VPN  
 Access corporate HQ via site-to-site VPN

### ■ Cloud-based centralized management

Managed centrally over the Web  
 Classifies applications, users and devices  
 Zero-touch, self-provisioning deployments



# Virtual MX for Amazon Web Services & Microsoft Azure

Virtual MX is a virtual instance of a Meraki security appliance, dedicated specifically to providing the simple configuration benefits of site-to-site Auto VPN for customers running or migrating IT services to an Amazon Web Services or Microsoft Azure Virtual Private Cloud (VPC). A virtual MX is added as an instance on EC2 or Azure and then configured in the Meraki dashboard, just like any other MX. It functions like a VPN concentrator.

An Auto VPN to a virtual MX is like having a direct Ethernet connection to a private datacenter. The

virtual MX can support up to 500 Mbps of VPN throughput, providing ample bandwidth for mission critical IT services hosted in AWS, like Active Directory, logging, or file and print services.

Secure connections built to a virtual MX benefit from the same SD-WAN capabilities as a physical MX appliance. An optimal path can be maintained using Dynamic Path Selection, for traffic destined for regular servers in a datacenter behind a physical MX, or virtual servers behind a virtual MX.

### ■ Licensing Details

#### Meraki

The virtual MX appliance is free and available in the AWS Marketplace. A Meraki cloud-management license is required and available in 1, 3, or 5 year options.

#### Amazon Web Services

Amazon charges either hourly or monthly for use of EC2 instances.

#### Microsoft Azure (available starting in October)

Microsoft Azure charges via a pay-as-you-go model.



Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software





Financing

Cisco Services

Programs & Promotions

# Cloud Managed Wireless

## ■ Cisco Meraki MR Cloud Managed Wireless Access Points

Model	Indoor Access Points			
	MR30H	MR33	MR42	MR52
Model				
Radios Specification	1 × 802.11b/g/n 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth	1 × 802.11b/g/n 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth	1 × 802.11b/g/n 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth	1 × 802.11b/g/n 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth
11n and 11ac Capabilities	2×2:2 MU-MIMO with beamforming	2×2:2 MU-MIMO with beamforming	3×3:3 MU-MIMO with beamforming	4×4:4 MU-MIMO with beamforming
Max Data Rate <sup>*1</sup>	1.3 Gbps	1.3 Gbps	1.9 Gbps	2.5 Gbps
Interface	1 × Gigabit Ethernet input 1 × Gigabit Ethernet LAN port with 802.3af PoE 3 × Gigabit Ethernet LAN ports	1 × Gigabit Ethernet port	1 × Gigabit Ethernet port	2 × Gigabit Ethernet port

\*1 Combined aggregate dual-band data rate.

# Cloud Managed Switches

## ■ Cisco Meraki MS Cloud Managed Switches

	Compact Switches		Access Switches					
	MS120-8	MS220-8	MS120-24	MS120-48	MS210-24	MS210-48	MS225-24	MS225-48
Downlinks	8 × GbE	8 × GbE	24 × GbE	48 × GbE	24 × GbE	48 × GbE	24 × GbE	48 × GbE
Uplinks	2 × SFP	2 × SFP	4 × 1G (SFP)	4 × 1G (SFP)	4 × 1G (SFP)	4 × 1G (SFP)	4 × 10G (SFP+)	4 × 10G (SFP+)
Stacking	Virtual	Virtual	Virtual	Virtual	80G (2 × 40G) MS225 compatible Virtual	80G (2 × 40G) MS225 compatible Virtual	80G (2 × 40G) Virtual	80G (2 × 40G) Virtual
PoE/PoE+ Power Budget	—	—	370 W	370 W	370 W	740 W	370 W	370 W (-48LP) 740 W (-48FP)
Switching Capacity	20 Gbps	20 Gbps	56 Gbps	104 Gbps	56 Gbps	104 Gbps	128 Gbps	176 Gbps




\*1UPOE (60 W) is supported.

# Cloud Managed Security Appliances





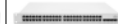




## ■ Cisco Meraki MX Cloud Managed Security Appliance Series






Model	Small Branch				
	MX64	MX64W	MX65	MX65W	MX84
Recommended Max Users	50	50	50	50	200
Stateful Firewall Throughput	250 Mbps	250 Mbps	250 Mbps	250 Mbps	500 Mbps
VPN Throughput per tunnel	85 Mbps	85 Mbps	85 Mbps	200 Mbps	200 Mbps
VPN Tunnels	-	-	-	-	100
Interfaces	5 × GbE	5 × GbE	12 × GbE (2 PoE+)	12 × GE (2 PoE+)	10 × GbE 2 × SFP
Wireless	-	Dual-band, dual-concurrent: 2.4 & 5 GHz 2-stream 802.11ac and 802.11n, up to 1.2 Gbps Supports up to 4 SSIDs	-	Dual-band, dual-concurrent: 2.4 & 5 GHz 2-stream 802.11ac and 802.11n, up to 1.2 Gbps Supports up to 4 SSIDs	-





Outdoor Access Points			Model
MR53	MR74	MR84	
			
1 × 802.11b/g/n 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth	1 × 802.11b/g/n 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth	1 × 802.11b/g/n/ac 1 × 802.11a/n/ac 1 × WIDS/WIPS 1 × Bluetooth	Radios Specification
4×4:4 MU-MIMO with beamforming	2×2:2 MU-MIMO with beamforming	4×4:4 MU-MIMO with beamforming	11n and 11ac Capabilities
2.5 Gbps	1.3 Gbps	2.5 Gbps	Max Data Rate <sup>*1</sup>
1 × 2.5Gbps Multigigabit Ethernet port 1 × Gigabit Ethernet port	1 × Gigabit Ethernet port Four external N-type connectors (antennas sold separately)	1 × 2.5 Gbps Multigigabit Ethernet port 1 × Gigabit Ethernet port Four external N-type connectors (antennas sold separately)	Interface

\*1 Combined aggregate dual-band data rate.

Access Switches					Distribution Switches				Model
MS250-24	MS250-48	MS350-24	MS350-24X	MS350-48	MS410-16	MS410-32	MS425-16	MS425-32	
									
24 x GbE	48 x GbE	24 x GbE	24 x GbE	48 x GbE	16 x SFP GbE	32 x SFP GbE	16 x SFP GbE	32 x SFP GbE	Downlinks
4 × 10G (SFP+)	4 × 10G (SFP+)	4 × 10G (SFP+)	4 × 10G (SFP+)	4 × 10G (SFP+)	2 / 4 × 10G (SFP+)	2 / 4 × 10G (SFP+)	2 / 4 × 40G QSFP+	2 / 4 × 40G QSFP+	Uplinks
80G (2 × 40G) Virtual	80G (2 × 40G) Virtual	160G (2 × 80G) Virtual	160G (2 × 80G) Virtual	160G (2 × 80G) Virtual	160G (2 × 80G)	160G (2 × 80G)	160G (2 × active QSFP+)	160G (2 × active QSFP+)	Stacking
370 W	370 W (-48LP) 740 W (-48FP)	370 W	740 W	370 W (-48LP) 740 W (-48FP)	–	–	–	–	PoE/PoE+ Power Budget
128 Gbps	176 Gbps	176 Gbps	72 Gbps	144 Gbps	72 Gbps	144 Gbps	480 Gbps	800 Gbps	Switching Capacity

Medium Branch		Large Branch, Campus / Concentrator			Model
MX100	MX250	MX400	MX450	MX600	
					
500	2000	2000	10000	10000	Recommended Max Users
750 Mbps	4 Gbps	1 Gbps	6 Gbps	1 Gbps	Stateful Firewall Throughput
375 Mbps	1 Gbps	900 Mbps	2 Gbps	900 Mbps	VPN Throughput per tunnel
250	1000	1000	5000	5000	VPN Tunnels
9 × GbE 2 × SFP	2 × 10G SFP+ (WAN)	Up to 20 × GbE Up to 16 × SFP	2 × 10GbE SFP+ (WAN)	Up to 20 × GbE Up to 16 × SFP	Interfaces
–	–	–	–	–	Wireless

# Cloud Managed Security Cameras

	Indoor Camera	Outdoor Camera
	MV21 <small>NEW</small>	MV72 <small>NEW</small>
Model		
Storage	128 GB High endurance solid state storage	128 GB High endurance solid state storage
Variable Field of View:	28° - 82° (Horizontal) 21° - 61° (Vertical) 37° - 107° (Diagonal)	28° - 82° (Horizontal) 21° - 61° (Vertical) 37° - 107° (Diagonal)
Video:	720p HD video recording (1280x720) with H.264 encoding	720p HD video recording (1280x720) with H.264 encoding
Ratings:		Weather-proof IP66-rated housing Vandal-proof IK10-rated housing
Interface:	1x 10/100 Base-T Ethernet (RJ45)	1x 10/100 Base-T Ethernet (RJ45)
Warranty:	3 Year hardware warranty	3 Year hardware warranty





Switches

Wireless

Routing

Security

Cisco Meraki

DNA-Center

SMB

Software

Financing

Cisco Services

Programs & Promotions



# DNA-Center

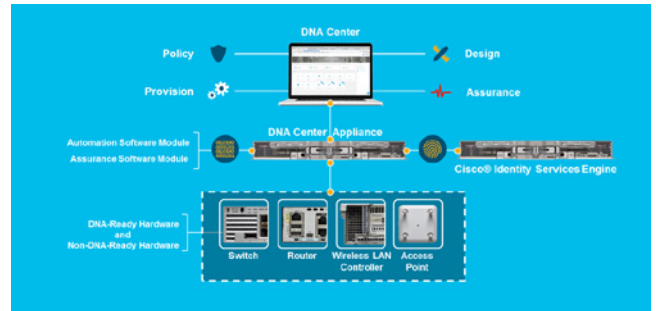
## Automation

### Cisco DNA Center

Cisco DNA Center can manage your end-to-end network from the campus, branch, and WAN to the cloud. It runs on Cisco's Software-Defined Networking (SDN) controller, the DNA-Center. Using intuitive workflows, DNA Center makes it easy to design, provision, and apply policy across your network. It also delivers end-to-end visibility and uses network insights to optimize network performance and deliver the best user and application experience.

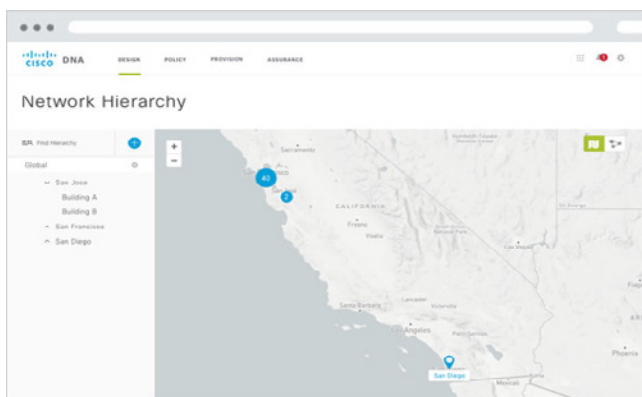
#### What are DNA Center Components?

- Design
- Policy
- Provision
- Assurance



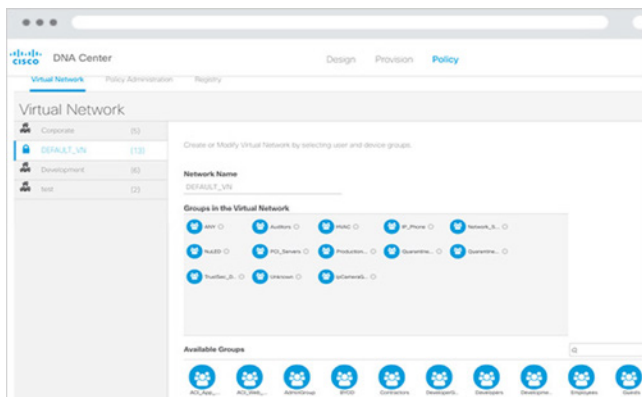
#### ■ Simple Design

Design your network using intuitive workflows, starting with locations where your network devices will be located. This graphical dashboard significantly reduce the time to design and provision one or more networks across your campus, WAN, branch.



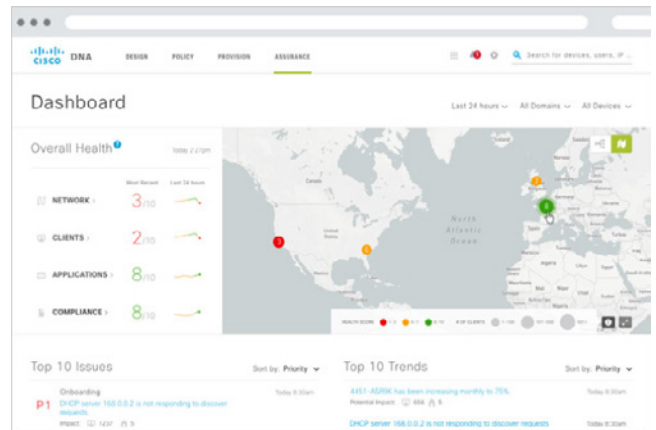
#### ■ Secure Policy

Quickly implement policy across your network to address changing business needs. Deploy group-based secure access and network segmentation based on business needs. With Cisco DNA Center, you apply policy to users and applications instead of to your network devices.



#### ■ Proactive Assurance

Use insights from DNA Analytics and Assurances to deliver a consistence experience, and proactively monitor, troubleshoot, and optimise your network.



#### ■ DNA Analytics and Assurance

Cisco Digital Network Architecture (DNA) Analytics and Assurance helps you get the most from your network. The solution proactively monitors your network, gathering and processing information from your devices, applications and users and presenting it in Cisco DNA Center, an easy-to-use single dashboard for managing all your analytics tasks.

The insights you gather from your network devices can influence your automation configuration and deployment decisions. Cisco DNA Center provides an integrated automation and assurance/analytics workflow, enabling you to quickly take action to remediate the issue. Think of it as a closed feedback loop.



## How does it all work?

### ■ Collect Data

Cisco collects from a comprehensive set of network data sources and provides software development kits to integrate third-party **telemetry** sources. Built-in sources include NetFlow, Syslog, Simple Network Management Protocol (SNMP), wireless controller, and streaming telemetry.

### ■ Condition Data

After data is collected, it's sorted and organized by various features including time, network element, user, device, application, location, and other network attributes.

### ■ Add Correlations

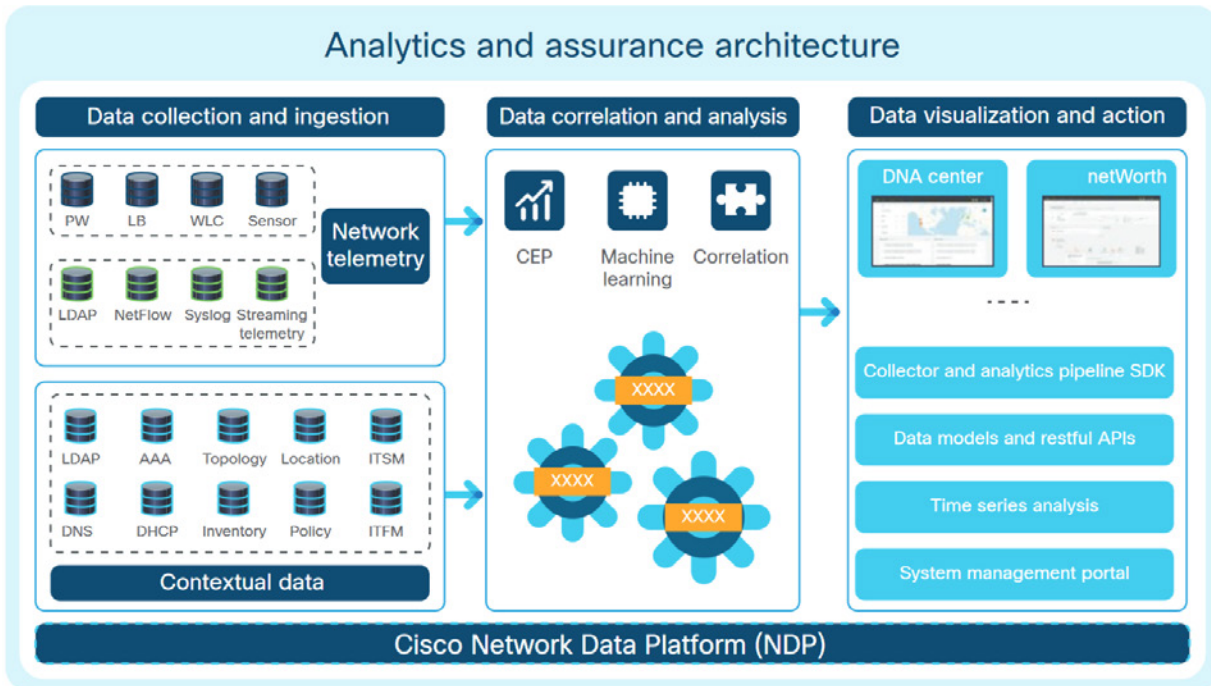
Cisco uses algorithms and our domain expertise to evaluate collected data and determine correlations between observed events and potential causes. The user doesn't have to wade through volumes of data to manually determine the root cause. The solution determines relations and provides the information in an easy-to-use dashboard: Cisco DNA Center.

### ■ Machine Learning

When machine learning is applied, the solution can evaluate trends and proactively determine which conditions tend to lead to performance issues. These predictive analytics can also be fed into Cisco DNA Center so users can take action on discoveries.

### ■ See in Cisco DNA Center

All insights from Analytics and Assurance are displayed in Cisco DNA Center, where they can be easily and quickly viewed and potential remediation can be suggested. The user can then use the automation tasks in Cisco DNA Center to put these insights into action. Cisco DNA automation enables IT to modify the network to remediate real and potential issues. As the self-driving network is fully realized, analytic insights can build the roadmap for automation actions.



## Benefits

- Cisco DNA Center provides an easy-to-use single dashboard for monitoring network health, identifying issue root causes, evaluating network configuration changes, and remediating issues.
- Cisco Assurance with its analytic engine collects data from multiple network sources to deliver comprehensive visibility into devices, users, and applications for proper context and correlation.
- Advanced correlation and machine learning algorithms proactively identify outliers that are reported as issues for remediation.
- Sensors proactively generate synthetic application and network traffic to probe wireless network performance.
- Recommended remediation options are driven by 30 years of Cisco domain expertise and best practices.
- Integration with automation workflows enables users to quickly remediate the issue.
- Open APIs can be used to intuitively access data and insights for faster and easier development at multiple layers getting only the desired data sets.

## What are customers' buying triggers?

- Network management is manual, complex and costly, resulting in human errors, causing downtime.
- Lack of visibility into the network makes it difficult to resolve issues quickly and reduce security threats.
- Onboarding and servicing users can be time consuming. They require multiple steps, which affect productivity and compromise security.
- Lack of actionable IT and business insights from the network can slow the business.

## Where is the opportunity?

- Customers that are interested in centralizing management and simplifying their networks with automation and assurance.
- Customers that have growing IoT needs and are concerned about security.
- Existing Cisco TrustSec customers that are looking to implement Software-Defined Access.
- Customers that are looking for better visibility and analytics-driven troubleshooting and capacity planning tools.
- Customers that need to replicate multiple sites such as branches.

## What to sell?


### ■ Hardware

- DNA Ready Infrastructure
- Catalyst 9000 product family
- Cisco DNA-Center Appliance
- Cisco ISE for identity and policy in the network enabled through DNA.

### ■ Software

- Lead with Cisco ONE™ Advantage when possible. Cisco ONE Advantage includes DNA Advantage, DNA Essentials, Stealthwatch®, ISE Base and Plus and SWSS. Cisco ONE Essentials includes DNA Essentials, ISE Base and Software support.
- DNA Essentials license for each network device (Cisco Catalyst® Switch, wireless access point or router) to enable base automation and monitoring capabilities on the network.
- DNA Advantage license for each network device (Cisco Catalyst Switch, wireless access point or router) to enable SD-Access, advance assurance capabilities and encrypted traffic analytics on the network.

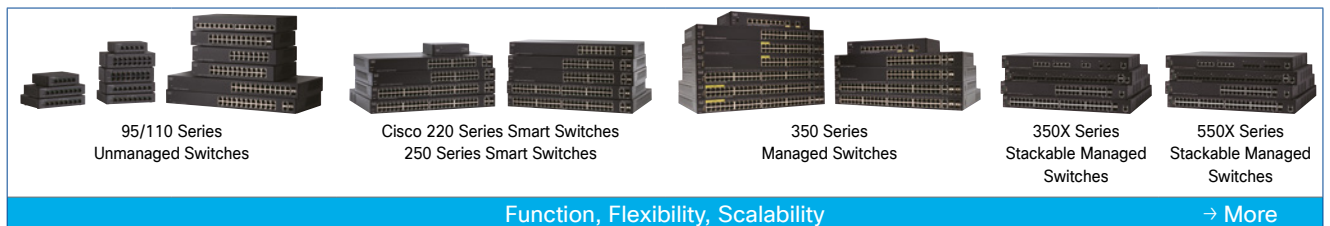
For more information please visit

 [www.cisco.com/go/DNAcenter](http://www.cisco.com/go/DNAcenter)



### Cisco 95 - 500 Series

- Cisco 95/110 Series Unmanaged Switches**  
 Get highly affordable Gigabit, Fast Ethernet, and PoE. No setup is required for QoS, network diagnostics, power-saving mode, and loop detection.
- Cisco 220 Series Smart Switches**  
 Build a simple, secure, and smart business network in minutes at a lower cost than you can with fully managed switches.
- Cisco 250 Series Smart Switches**  
 Entry-level managed switch features and easy management at a great price. Build a business-class network with the features you need.
- Cisco 350 Series Managed Switches**  
 The ideal combination of affordability and advanced network features for small business, these easy to use fully managed switches are the cornerstone of your network.
- Cisco 350X Series Stackable Managed Switches**  
 Our managed switches deliver an ideal combination of affordability and advanced features with 10-Gigabit Ethernet and stacking.
- Cisco 550X Series Stackable Managed Switches**  
 These next-generation stackable managed switches offer 10-Gigabit Ethernet and advanced capabilities to accelerate your business growth.



Function, Flexibility, Scalability

→ More

\* Cisco 200/300/500 Series are still for sale and not officially end of life.

#### ■ Cisco 95 Series Unmanaged Switches

New Model Name	Legacy Model Name	Orderable SKU	Ports							PoE					AC Power	Fan less	Stack able	Rack Mount	
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T/SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports					Pass through
SF95D-05	SF90D-05	SF95D-05-xx	5	-	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF95D-08	SF90D-08	SF95D-08-xx	8	-	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF95D-16	SF90D-16	SF95D-16-xx	16	-	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF95-24	SF90-24	SF95-24-xx	24	-	-	-	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG95D-05	SG90D-05	SG95D-05-xx	-	5	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SG95D-08	SG90D-08	SG95D-08-xx	-	8	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SG95-16	SG92-16	SG95-16-xx	-	16	-	-	-	-	-	-	-	-	-	-	-	Internal	●	-	-
SG95-24	SG92-24	SG95-24-xx	-	22	-	2	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU

#### ■ Cisco 110 Series Unmanaged Switches

New Model Name	Legacy Model Name	Orderable SKU	Ports							PoE					AC Power	Fan less	Stack able	Rack Mount	
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T/SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports					Pass through
SF110D-05	SF100D-05	SF110D-05-xx <sup>*1</sup>	5	-	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF110D-08	SF100D-08	SF110D-08-xx	8	-	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF110D-08HP	SF100D-08P	SF110D-08HP-xx	8	-	-	-	-	-	-	-	4	-	32 W	af	-	External	●	-	-
SF110D-16	SF100D-16	SF110D-16-xx <sup>*1</sup>	16	-	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SF110D-16HP	SF100D-16P	SF110D-16HP-xx <sup>*1</sup>	16	-	-	-	-	-	-	-	8	-	64 W	af	-	External	●	-	-
SF110-16	SF100-16	SF110-16-xx <sup>*1</sup>	16	-	-	-	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF110-24	SF100-24	SF110-24-xx	24	-	-	-	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF112-24	SF102-24	SF112-24-xx	-	22	-	2	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG110D-05	SG100D-05	SG110D-05-xx	-	5	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SG110D-08	SG100D-08	SG110D-08-xx	-	8	-	-	-	-	-	-	-	-	-	-	-	External	●	-	-
SG110D-08HP	SG100D-08P	SG110D-08HP-xx	-	8	-	-	-	-	-	-	4	-	32 W	af	-	External	●	-	-
SG110-16	SG100-16	SG110-16-xx	-	16	-	-	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG110-16HP	n/a	SG110-16HP-xx	-	16	-	-	-	-	-	-	8	-	64 W	af	-	Internal	●	-	1 RU
SG110-24	SG100-24	SG110-24-xx	-	22	-	2	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SG110-24HP	n/a	SG110-24HP-xx	-	22	-	2	-	-	-	-	12	-	100 W	af	-	Internal	-	-	1 RU
SG112-24	SG102-24	SG112-24-xx	-	22	-	2	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU

#### ■ Cisco 220 Series Smart Switches

New Model Name	Legacy Model Name	Orderable SKU	Ports							PoE					AC Power	Fan less	Stack able	Rack Mount	
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T/SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports					Pass through
SF220-24	SF200E-24	SF220-24-K9-xx <sup>*1</sup>	24	-	-	2	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF220-24P	SF200E-24P	SF220-24P-K9-xx <sup>*1</sup>	24	-	-	2	-	-	-	-	24	-	180 W	af/at	-	Internal	-	-	1 RU
SF220-48	SF200E-48	SF220-48-K9-xx <sup>*1</sup>	48	-	-	2	-	-	-	-	-	-	-	-	Internal	●	-	1 RU	
SF220-48P	SF200E-48P	SF220-48P-K9-xx <sup>*1</sup>	48	-	-	2	-	-	-	-	48	-	375 W	af/at	-	Internal	-	-	1 RU
SG220-26	n/a	SG220-26-K9-xx	-	24	-	2	-	-	-	-	-	-	-	-	Internal	●	-	1 RU	
SG220-26P	n/a	SG220-26P-K9-xx	-	24	-	2	-	-	-	-	24	-	180 W	af/at	-	Internal	-	-	1 RU
SG220-50	n/a	SG220-50-K9-xx	-	48	-	2	-	-	-	-	-	-	-	-	Internal	-	-	1 RU	
SG220-50P	n/a	SG220-50P-K9-xx	-	48	-	2	-	-	-	-	48	-	375 W	af/at	-	Internal	-	-	1 RU

\*1 The \*-AU\* SKUs have reached end-of-life status.

### ■ Cisco 250 Series Smart Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE						AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T /SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports	Pass through				
SF250-48	SF200-48	SF250-48-K9-xx	48	-	2	2	-	-	-	-	-	-	-	-	-	Internal	●	-	1 RU
SF250-48HP	SF200-48P	SF250-48HP-K9-xx	48	-	2	2	-	-	-	48	-	195 W	af/at	-	-	Internal	-	-	1 RU
SG250-10P	SG200-10FP	SG250-10P-K9-xx	-	8	-	2	-	-	-	8	-	62 W	af/at	2	●	External	●	-	1 RU
SG250-26	SG200-26	SG250-26-K9-xx	-	24	-	2	-	-	-	-	-	-	-	-	Internal	●	-	1 RU	
SG250-26HP	SG200-26P	SG250-26HP-K9-xx	-	24	-	2	-	-	-	24	-	100 W	af/at	-	-	Internal	-	-	1 RU
SG250-26P	SG200-26FP	SG250-26P-K9-xx	-	24	-	2	-	-	-	24	-	195 W	af/at	-	-	Internal	-	-	1 RU

### ■ Cisco 350 Series Managed Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE						AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T /SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports	Pass through				
SF350-48	SF300-48	SF350-48-K9-xx	48	-	2	2	-	-	-	-	-	-	-	-	Internal	-	-	1 RU	
SF350-48P	SF300-48PP	SF350-48P-K9-xx	48	-	2	2	-	-	-	48	8	382 W	af/at	-	-	Internal	-	-	1 RU
SF350-48MP	n/a	SF350-48MP-K9-xx	48	-	2	2	-	-	-	48	8	740 W	af/at	-	-	Internal	-	-	1 RU
SG350-10	SG300-10	SG350-10-K9-xx	-	8	-	2	-	-	-	-	-	-	-	2	●	External	●	-	1 RU
SG350-10P	SG300-10PP	SG350-10P-K9-xx	-	8	-	2	-	-	-	8	-	62 W	af/at	2	●	External	●	-	1 RU
SG350-10MP	SG300-10MPP	SG350-10MP-K9-xx	-	8	-	2	-	-	-	8	-	124 W	af/at	2	●	External	●	-	1 RU
SG350-10P	n/a	SG350-10P-K9-xx	-	8	-	2	-	-	-	8	-	62 W	af/at	2	●	Internal	●	-	1 RU
SG350-28	SG300-28	SG350-28-K9-xx	-	24	2	2	-	-	-	-	-	-	-	-	Internal	●	-	1 RU	
SG350-28P	SG300-28PP	SG350-28P-K9-xx	-	24	2	2	-	-	-	24	4	195 W	af/at	-	-	Internal	-	-	1 RU
SG350-28MP	SG300-28MP	SG350-28MP-K9-xx	-	24	2	2	-	-	-	24	4	382 W	af/at	-	-	Internal	-	-	1 RU

### ■ Cisco 350X Series Stackable Managed Switches

New Model Name	Existing Model Name	Orderable SKU	Ports							PoE						AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T /SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports	Pass through				
SG350X-24	n/a	SG350X-24-K9-xx	-	24	-	-	-	2	2	-	-	-	-	-	Internal	-	●	1 RU	
SG350X-24P	n/a	SG350X-24P-K9-xx	-	24	-	-	-	2	2	24	4	195 W	af/at	-	-	Internal	-	●	1 RU
SG350X-24MP	n/a	SG350X-24MP-K9-xx	-	24	-	-	-	2	2	24	4	382 W	af/at	-	-	Internal	-	●	1 RU
SG350X-48	n/a	SG350X-48-K9-xx	-	48	-	-	-	2	2	-	-	-	-	-	Internal	-	●	1 RU	
SG350X-48P	n/a	SG350X-48P-K9-xx	-	48	-	-	-	2	2	48	8	382 W	af/at	-	-	Internal	-	●	1 RU
SG350X-48MP	n/a	SG350X-48MP-K9-xx	-	48	-	-	-	2	2	48	8	740 W	af/at	-	-	Internal	-	●	1 RU
SG350XG-2F10	n/a	SG350XG-2F10-K9-xx	-	-	-	-	10	2	-	-	-	-	-	-	Internal	-	●	1 RU	
SG350XG-24T	n/a	SG350XG-24T-K9-xx	-	-	-	-	22	2	-	-	-	-	-	-	Internal	-	●	1 RU	
SG350XG-24F	n/a	SG350XG-24F-K9-xx	-	-	-	-	22	2	-	-	-	-	-	-	Internal	-	●	1 RU	
SG350XG-48T	n/a	SG350XG-48T-K9-xx	-	-	-	-	46	2	-	-	-	-	-	-	Internal	-	●	1 RU	

### ■ Cisco 550X Series Stackable Managed Switches

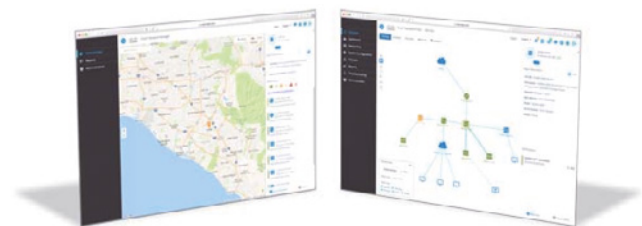
New Model Name	Existing Model Name	Orderable SKU	Ports							PoE						AC Power	Fan less	Stack able	Rack Mount
			FE	GE	SFP	GE/SFP	10 GB-T	SFP+	10GB-T /SFP+	Ports	60 W Ports	Power Budget	IEEE 802.3	Input Ports	Pass through				
SF550X-24	SF500-24	SF550X-24-K9-xx	24	-	-	-	-	2	2	-	-	-	-	-	Internal	-	●	1 RU	
SF550X-24P	SF500-24P	SF550X-24P-K9-xx	24	-	-	-	-	2	2	24	8	195 W	af/at	-	-	Internal	-	●	1 RU
SF550X-24MP	SF500-24MP	SF550X-24MP-K9-xx	24	-	-	-	-	2	2	24	8	382 W	af/at	-	-	Internal	-	●	1 RU
SF550X-48	SF500-48	SF550X-48-K9-xx	48	-	-	-	-	2	2	-	-	-	-	-	Internal	-	●	1 RU	
SF550X-48P	SF500-48P	SF550X-48P-K9-xx	48	-	-	-	-	2	2	48	16	382 W	af/at	-	-	Internal	-	●	1 RU
SF550X-48MP	SF500-48MP	SF550X-48MP-K9-xx	48	-	-	-	-	2	2	48	16	740 W	af/at	-	-	Internal	-	●	1 RU
SG550X-24	SG500X-24	SG550X-24-K9-xx	-	24	-	-	-	2	2	-	-	-	-	-	Internal	-	●	1 RU	
SG550X-24P	n/a	SG550X-24P-K9-xx	-	24	-	-	-	2	2	24	8	195 W	af/at	-	-	Internal	-	●	1 RU
SG550X-24MP	SG500X-24P	SG550X-24MP-K9-xx	-	24	-	-	-	2	2	24	8	382 W	af/at	-	-	Internal	-	●	1 RU
SG550X-24MPP	SG500X-24MPP	SG550X-24MPP-K9-xx	-	24	-	-	-	2	2	24	8	740 W	af/at	-	-	Internal	-	●	1 RU
SG550X-48	SG500X-48	SG550X-48-K9-xx	-	48	-	-	-	2	2	-	-	-	-	-	Internal	-	●	1 RU	
SG550X-48P	SG500X-48P	SG550X-48P-K9-xx	-	48	-	-	-	2	2	48	16	382 W	af/at	-	-	Internal	-	●	1 RU
SG550X-48MP	SG500X-48MP	SG550X-48MP-K9-xx	-	48	-	-	-	2	2	48	16	740 W	af/at	-	-	Internal	-	●	1 RU
SG550XG-8F8T	n/a	SG550XG-8F8T-K9-xx	-	-	-	-	8	8	-	-	-	-	-	-	Internal	-	●	1 RU	
SG550XG-24T	n/a	SG550XG-24T-K9-xx	-	-	-	-	22	2	-	-	-	-	-	-	Internal	-	●	1 RU	
SG550XG-24F	n/a	SG550XG-24F-K9-xx	-	-	-	-	22	2	-	-	-	-	-	-	Internal	-	●	1 RU	
SG550XG-48T	n/a	SG550XG-48T-K9-xx	-	-	-	-	46	2	-	-	-	-	-	-	Internal	-	●	1 RU	

## Cisco FindIT Network Management

In addition to the proven **Cisco FindIT Network Discovery Utility**, Cisco introduces the new network management tool, **Cisco FindIT Network Manager**. It provides:

- Automatic discovery for the network devices, a topology diagram and an inventory report.
- A customizable monitoring dashboard. It allows you to easily see the state of the network and how it is performing. Be alerted automatically to important events such as network devices going offline.
- A single interface to configure system information, wireless networks, virtual LANs, and Ethernet switching.

Cisco FindIT Network Manager is implemented as a software product on Oracle VirtualBox, VMware ESXi, and so on. Up to 10 Cisco 100-500 Series Switches may be managed in Evaluation Mode without a license.



### ■ Cisco FindIT Network Manager License NEW

SKU	Description
LS-FINDITNM-15-1Y=	15-device license - 1 year
LS-FINDITNM-25-1Y=	25-device license - 1 year
LS-FINDITNM-50-1Y=	50-device license - 1 year

# Cisco WAP Access Points

Cisco WAP Access Points combine business-class features with the reliability and performance needed for small business networks. The **Single Point Setup (SPS)** feature makes deployment of multiple access point easy and cost effective.

- Cisco 100 Series Wireless Access Points**  
 Sleek and simple to configure, our 100 Series delivers the performance you need at an affordable price.
- Cisco 300 Series Wireless Access Points**  
 Get Gigabit speed for your mobile devices. Use our simple controller-less management to manage multiple access points.
- Cisco 500 Series Wireless Access Points**  
 Get exceptional performance and coverage for mobile devices and next-generation applications. Use our simple, controller-less management to expand your wireless network.

High →

Price, Performance

Function, Flexibility, Scalability → More

## ■ Cisco 100 Series Wireless Access Points

SKU	Wireless Data Rate	Active Users per Radio	IEEE 802			2.4 GHz	5 GHz	Con current Radios	Ports			PoE Ports		AC Power
			11n	11ac Wave 1	11ac Wave 2				FE	GE	mGig	Input	Output	
WAP121-x-K9-xx	300 Mbps	16	●	-	-	●	-	-	1	-	-	1 <sup>*1</sup>	-	External
WAP125-x-K9-xx <b>-NEW-</b>	867 Mbps	16	●	●	-	●	●	-	-	1	-	1 <sup>*1</sup>	-	External
WAP131-x-K9-xx	300 Mbps	16	●	-	-	●	●	●	-	1	-	1 <sup>*1</sup>	-	External
WAP150-x-K9-xx	867 Mbps	16	●	●	-	●	●	●	-	1	-	1 <sup>*1</sup>	-	External

## ■ Cisco 300 Series Wireless Access Points

SKU	Wireless Data Rate	Active Users per Radio	IEEE 802			2.4 GHz	5 GHz	Con current Radios	Ports			PoE Ports		AC Power
			11n	11ac Wave 1	11ac Wave 2				FE	GE	mGig	Input	Output	
WAP361-x-K9	867 Mbps	32	●	●	-	●	●	●	-	5	-	1 <sup>*2</sup>	1	External
WAP371-x-K9	1299 Mbps	32	●	●	-	●	●	●	-	1	-	1 <sup>*2</sup>	-	External










## ■ Cisco 500 Series Wireless Access Points

SKU	Wireless Data Rate	Active Users per Radio	IEEE 802			2.4 GHz	5 GHz	Con current Radios	Ports			PoE Ports		AC Power
			11n	11ac Wave 1	11ac Wave 2				FE	GE	mGig	Input	Output	
WAP561-x-K9	450 Mbps	64	●	-	-	●	●	●	-	1	-	1 <sup>*2</sup>	-	-
WAP571-x-K9	1299 Mbps	32	●	●	-	●	●	●	-	2	-	2 <sup>*2</sup>	-	-
WAP571E-x-K9	1299 Mbps	32	●	●	-	●	●	●	-	2	-	2 <sup>*2</sup>	-	-
WAP581-x-K9 <b>-NEW-</b>	1733 Mbps	64	●	●	●	●	●	●	-	1	1	2 <sup>*2</sup>	-	External

\*1 Power Adapter (included) or Power Injector is required when not using PoE receiving. \*2 Power Adapter or Power Injector is required when not using PoE receiving.

# Cisco Aironet Access Points

## Indoor Access Points

2.6 Gbps		 HDX	 HDX mGig
1.7 Gbps			
1.3 Gbps	 HDX	 HDX	
867 Mbps			 NEW
			
	11ac Wave 1		11ac Wave 2

### ■ Cisco Aironet Indoor Access Points

All models of the **Cisco Aironet Indoor Access Points** are compatible with the IEEE 802.11n standard; and some models are also compatible with IEEE 802.11ac delivering high-speed and stable wireless LAN environments with a theoretical maximum throughput of between 300 Mbps and 2.6 Gbps. A broad selection of models is available for various installation environments and network requirements.

- **Built-in antenna model:** These models feature a streamlined body and an integrated LAN/power cable using PoE (Power over Ethernet) for a stylish installation that blends into the office environment.
- **External antenna model:** These models feature a rigid metal chassis and support a wide range of operating temperatures for use in factories, warehouses and stores where environmental requirements are very strict. A wide selection of antennas are available for these models to suit different installation environments.

There are two types of models for Cisco Aironet Indoor Access Points: **Standalone** or **Mobility Express** models, and **Controller-based** models. The Controller-based models are designed to operate in linkage with the **Cisco Wireless Controllers**.

### ■ Highlights

- IEEE 802.11n-compatible (All models)
- IEEE 802.11ac Wave 1-compatible (Cisco Aironet 1700/2700/3700 Series)
- IEEE 802.11ac Wave 2-compatible (Cisco Aironet 1810/1810w/1815i/1815m/1815t/1815w/1830/1850/2800/3800 Series)
- 2.4 GHz/5 GHz dual-band (All models)
- **Cisco CleanAir Express** (Controller-based models of the Cisco Aironet 1700 Series)
- **Cisco CleanAir** (Controller-based models of the Cisco Aironet 2700/2800/3700/3800 Series)
- **Cisco OfficeExtend** (Controller-based models, excluding some models)
- **Cisco ClientLink** (excluding some models)
- **Cisco BandSelect** (Controller-based models, excluding some models)

For details on **Cisco Aironet Indoor Access Points**, visit the following Web site:

 [www.cisco.com/go/ap](http://www.cisco.com/go/ap)

## Cisco Aironet Access Points Transition Guide

### ■ Cisco Aironet Indoor Access Points

11n	11ac Wave 1	11ac Wave 2
Cisco Aironet 600 Series OfficeExtend	-	Cisco Aironet 1810
Cisco Aironet 700 Series	-	Cisco Aironet 1815i/1830 Series
Cisco Aironet 700W Series	-	Cisco Aironet 1815w
Cisco Aironet 1040 Series Cisco Aironet 1600 Series	Cisco Aironet 1700 Series	Cisco Aironet 1850 Series
Cisco Aironet 1140 Series Cisco Aironet 1250 Series Cisco Aironet 1260 Series Cisco Aironet 2600 Series	Cisco Aironet 2700 Series	Cisco Aironet 2800 Series
Cisco Aironet 3500 Series Cisco Aironet 3600 Series	Cisco Aironet 3700 Series	Cisco Aironet 3800 Series

\*1 Cisco Aironet 3600/3700 Series are planned to support 11ac Wave 2 via addition of a module.

# Cisco RV Series

Cisco RV Series are affordable, highly secure network access devices, designed and built for small businesses. Cisco offers a broad range of small business routers to meet any requirement from basic Internet connectivity to high-capacity, business-critical networking.

GE WAN									ISR
FE WAN									
Performance, Function, Flexibility, Scalability									→ High

## ■ Cisco RV Series

SKU	WAN Ports				LAN Ports		PoE			IPsec Throughput	IPsec VPN Tunnels		Web Filtering	Wireless				AC Power
	FE	GE	xDSL	3G/4G	FE	GE	Ports	Power Budget	IEEE 802.3		Site-to-Site	Remote Access		11n	11ac	2.4 GHz	5 GHz	
RV042	2	-	-	-	4	-	-	-	-	59 Mbps	50	50	-	-	-	-	External	
RV042G-K9-xx	-	2	-	-	-	4	-	-	-	75 Mbps	50	50	-	-	-	-	External	
RV130-K9-xx	-	1	-	1 <sup>*1</sup>	-	4	-	-	-	50 Mbps	10	10	-	-	-	-	External	
RV130-WB-K9-xx	-	1	-	1 <sup>*1</sup>	-	4	-	-	-	50 Mbps	10	10	●	-	-	-	External	
RV130W-x-K9-xx	-	1	-	1 <sup>*1</sup>	-	4	-	-	-	50 Mbps	10	10	●	●	-	●	External	
RV130W-x-WB-K9-xx	-	1	-	1 <sup>*1</sup>	-	4	-	-	-	50 Mbps	10	10	●	●	-	●	External	
RV132W-x-K9-xx	1	-	1	1 <sup>*1</sup>	3	-	-	-	-	3 Mbps	5	5	-	●	-	●	External	
RV134W-x-K9-xx	-	1	1	1 <sup>*1</sup>	-	4	-	-	-	20 Mbps	5	5	-	●	●	●	External	
RV215W-x-K9-xx	1	-	-	1 <sup>*1</sup>	4	-	-	-	-	5 Mbps	1	5	-	●	-	●	External	
RV320-K9-xx	-	2	-	1 <sup>*1</sup>	-	4	-	-	-	100 Mbps	25	25	-	-	-	-	External	
RV320-WF-K9-xx	-	2	-	1 <sup>*1</sup>	-	4	-	-	-	100 Mbps	25	25	●	-	-	-	External	
RV325-K9-xx	-	2	-	1 <sup>*1</sup>	-	14	-	-	-	100 Mbps	25	25	-	-	-	-	External	
RV325-WF-K9-xx	-	2	-	1 <sup>*1</sup>	-	14	-	-	-	100 Mbps	25	25	●	-	-	-	External	
RV340-K9-xx	-	2	-	1 <sup>*1</sup>	-	4	-	-	-	650 Mbps	50	50	● <sup>*2</sup>	-	-	-	External	
RV340W-K9-xx	-	2	-	1 <sup>*1</sup>	-	4	-	-	-	650 Mbps	50	50	● <sup>*2</sup>	●	●	●	External	
RV345-K9-xx	-	2	-	1 <sup>*1</sup>	-	16	-	-	-	650 Mbps	50	50	● <sup>*2</sup>	-	-	-	External	
RV345P-K9-xx	-	2	-	1 <sup>*1</sup>	-	16	8	120 W	af/at	650 Mbps	50	50	● <sup>*2</sup>	-	-	-	External	

\*1 3G/4G modem is required. \*2 Security License is required.

## New Models with Web Filtering

Your business and your employees are exposed to phishing, key loggers, spyware, drive-by malware, and other online threats. With the new **RV130 /130W/320/325/340/340W/345/345P with web filtering (WF)**, you can keep your employees and users safe from unwanted content and malicious websites. This is accomplished without compromising the users' online experience and can even help boost employee productivity and network performance by limiting Internet surfing to appropriate site categories and eliminating unwanted network traffic. Users are also automatically protected from malicious/compromised websites, regardless of site categorization.

- **Dynamic Web Filtering**  
Router checks URLs with Cisco cloud  
Router caches websites to speed up response time over time
- **Classification System**  
300 Million web URL's categorized and assigned reputation score  
Sophisticated website reputation scoring (think of credit score)  
80+ content categories  
Real-time updates
- **No License Renewal are Necessary (RV130/130W/320/325)**



# Cisco ISR 800 Series

Fixed-configuration Integrated Services Routers suitable for deployment in small-sized bases, home offices and Machine-to-Machine (M2M) environments. In addition to the routing service, a wide variety of services including switching, wireless security, unified communication, and WAN optimization can be integrated using a single router unit.



- **Highlights**
  - Cisco IOS Universal Image (IP Base/Advanced Security/Advanced IP Services)
  - Built-in managed switch (All models)
  - Built-in IEEE 802.11n-compatible wireless access point (C819GW-LTE-LA-xK9<sup>1</sup>/C881W-x-K9)
  - 4G LTE wireless WAN (Some models)

## ■ Cisco ISR 800 Series (1 of 2)

SKU	Description	Dimensions (Height x Width x Depth)	Maximum Weight
C819H-K9	Cisco ISR 819H M2M Hardened Model	4.39 x 19.56 x 20.57 cm	1.45 kg
C819G-LTE-LA-K9	<span style="color:red">-NEW-</span> Cisco ISR 819G 4G LTE 2.5 M2M Model	4.24 x 19.56 x 18.29 cm	1.04 kg
C819GW-LTE-LA-xK9 <sup>1</sup>	<span style="color:red">-NEW-</span> Cisco ISR 819G 4G LTE 2.5 Wireless M2M Model	4.24 x 19.56 x 22.86 cm	1.04 kg
C819HG-4G-G-K9	Cisco ISR 819HG 4G LTE M2M Hardened Model	4.39 x 19.56 x 20.57 cm	1.45 kg
C867VAE	Cisco ISR 867VAE IP Base Model	3.85 x 20.90 x 19.80 cm	2.49 kg
C867VAE-K9	Cisco ISR 867VAE Advanced Security Model	3.85 x 20.90 x 19.80 cm	2.49 kg
C881W-x-K9 <sup>1</sup>	Cisco ISR 881W Wireless Model	4.82 x 32.51 x 26.42 cm	2.49 kg
C881-V-K9	Cisco ISR 881-V Router	4.82 x 32.51 x 24.89 cm	2.49 kg
C891F-K9	Cisco ISR 891F Router	4.62 x 32.28 x 24.84 cm	2.49 kg
C891-24X/K9	Cisco ISR 891-24X	4.62 x 43.82 x 30.48 cm	2.49 kg
C892FSP-K9	Cisco ISR 892FSP	4.62 x 32.28 x 24.84 cm	2.49 kg
C897VA-K9	Cisco ISR 897VA	4.62 x 32.28 x 24.84 cm	2.49 kg
C897VAG-LTE-LA-K9	<span style="color:red">-NEW-</span> Cisco ISR 897VAG 4G LTE 2.5 Model	4.82 x 32.51 x 26.42 cm	2.58 kg
C898EAG-LTE-LA-K9	<span style="color:red">-NEW-</span> Cisco ISR 898EAG 4G LTE 2.5 Model	4.82 x 32.51 x 26.42 cm	2.58 kg
C899G-LTE-LA-K9	<span style="color:red">-NEW-</span> Cisco ISR 899G 4G LTE 2.5 Model	4.82 x 32.51 x 26.42 cm	2.58 kg

## ■ Cisco ISR 800 Series (2 of 2)

SKU	Cisco IOS	WAN Ports						LAN Ports		Wireless		Security		Voice	WAASX	Rack mount
		FE	GE	GE/SFP	ISDN	xDSL	Voice	FE	GE	AP	4G LTE	FW	VPN			
C819H-K9	Advanced IP Services	-	1	-	-	-	-	4	-	-	-	●	●	-	●	- <sup>5</sup>
C819G-LTE-LA-K9	<span style="color:red">-NEW-</span> Advanced IP Services	-	1	-	-	-	-	4	-	-	-	●	●	-	●	- <sup>5</sup>
C819GW-LTE-LA-xK9	<span style="color:red">-NEW-</span> Advanced IP Services	-	1	-	-	-	-	4	-	●	●	●	●	-	●	- <sup>5</sup>
C819HG-4G-G-K9	Advanced IP Services	-	1	-	-	-	-	4	-	-	●	●	●	-	●	- <sup>5</sup>
C867VAE	IP Base	-	1	-	-	1	-	3	2	-	-	-	-	-	-	-
C867VAE-K9	Advanced Security	-	1	-	-	1	-	3	2	-	-	●	●	-	-	-
C881W-x-K9	Advanced Security	1	-	-	-	-	-	4	-	●	-	●	●	-	-	-
C881-V-K9	Advanced IP Services	1	-	-	-	-	7 <sup>2</sup>	4	-	-	-	●	●	● <sup>3</sup>	-	-
C891F-K9	Advanced IP Services	1	-	1	1	-	-	8	-	-	-	●	●	-	● <sup>4</sup>	- <sup>6</sup>
C891-24X/K9	Advanced IP Services	-	-	2	-	-	-	24	-	-	-	●	●	-	-	- <sup>7</sup>
C892FSP-K9	Advanced IP Services	-	1	1	-	-	-	8	-	-	-	●	●	-	● <sup>4</sup>	- <sup>6</sup>
C897VA-K9	Advanced IP Services	-	-	1	1	1	-	8	-	-	-	●	●	-	● <sup>4</sup>	- <sup>6</sup>
C897VAG-LTE-LA-K9	<span style="color:red">-NEW-</span> Advanced IP Services	-	-	1	-	1	-	8	-	-	●	●	●	-	● <sup>4</sup>	- <sup>6</sup>
C898EAG-LTE-LA-K9	<span style="color:red">-NEW-</span> Advanced IP Services	-	-	1	-	1	-	8	-	-	●	●	●	-	● <sup>4</sup>	- <sup>6</sup>
C899G-LTE-LA-K9	<span style="color:red">-NEW-</span> Advanced IP Services	-	1	1	-	-	-	8	-	-	●	●	●	-	● <sup>4</sup>	- <sup>6</sup>

\*1 The "x" corresponds to the supported domain. \*2 BRI x 2, FXS x 4, FXO x 1. \*3 Call control and messaging are not supported. \*4 Feature License is required. \*5 DIN Rail Mount and Floor/Wall Mount are supported (Optional). \*6 ACS-890-RM-19 is required. \*7 ACS-2901-RM-19 is required.

# Machine-to-Machine (M2M)

**Machine-to-Machine (M2M)** is a technology that aggregates the intercommunications between machines without human intervention. This technology is already used in a wide range of devices such as vending machines, surveillance systems and sensor-equipped measuring instruments; and its adoption is expected to continue at an accelerated pace. The most important elements for network devices offering the M2M technology are compactness, mobility and durability. In the case of vending machines, for example, the network device needs to be compact to allow installation inside the machines. Mobility is also important as it is cheaper to use the mobile 4G network than installing a wired broadband line for each vending machine. Depending on the installation location, the network device must also have the durability to withstand the high temperatures in summer. **Cisco 819H/G/HG** has been developed to address these issues. Both models feature a palm-sized compact chassis and are compatible with 4G LTE 2.0 wireless LAN. Furthermore, **Cisco 819H/HG** can operate in temperatures between -23 and +60 deg C and in up to 95% humidity and have superior

vibration and impact resistance to withstand industrial use. A wide variety of mounting options are supported including DIN rail, floor and wall mounting.



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# Software

## Cisco DNA for Access: Switching and Wireless Subscription Offers

### Introduction

Traditional networks cannot meet the demands of a digital network. Traditional networks were hardware centric, manual with fragmented security, and focused on network data. The new network that drives digital business demands a software-driven approach, automation, built-in security, business insights with proactive monitoring, and troubleshooting. With this vision, Cisco launched the new era of networking powered by the Cisco® Digital Network Architecture (Cisco DNA™).

The latest innovations in Cisco DNA include new software capabilities that deliver greater intelligence and security through Cisco ONE™ and Cisco DNA subscription licensing for access switching and wireless software and an architectural approach that delivers end-to-end visibility, automation, and insights for switching. Introducing new subscription offers for access switching and wireless built on an entirely new era of intent-based networking.

#### Cisco DNA for access switching subscription

Scale your network for business expansion; segment your network for security, compliance, and complex processes; and centralize network access policy management for secure access.

#### Cisco DNA for access wireless subscription

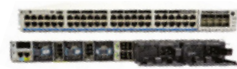
Get exceptional wireless performance for high-density environments; personalize services through location-based solutions; and secure your network by protecting devices, data, and your business with strong, network-based security.

#### ■ Benefits of software subscription

- Ongoing access to newest features
- Up-to-date security protection
- Software refresh independent of hardware
- Ability to renew and scale what you want
- License portability for flexibility
- Better together pricing
- Linear, predictable budget spend

#### ■ DNA for Switching: Subscription Offer Structure

### DNA for Switching: Subscription Offer Structure



Catalyst 3K, 4K, 6K, new 9K switches

### Software Support included in all subscriptions

#### ■ DNA for Switching: Subscription Offer Structure

- The new Cisco DNA subscription for switching is available on current generation switches such as Cisco Catalyst® 3000, 4000, and 6000 Series as well as on recently announced Cisco Catalyst 9000 Series switches
- Software subscription is offered as a 3-, 5-, or 7-year term

**Cisco ONE advantage** delivers policy-based automation with SD Access, Cisco DNA assurance, and enhanced security.

Customers can enable all Cisco DNA use cases with Cisco ONE Advantage. Offered as a single SKU.

**Cisco DNA advantage** delivers policy-based automation with SD Access, monitoring, and Cisco DNA Assurance.

Customers need to buy ISE Base, ISE Plus, and Stealthwatch to enable all Cisco DNA use cases.

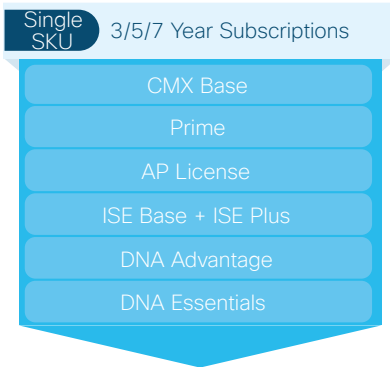
**Cisco DNA essentials** delivers base automation, monitoring, and management.

With this solution, customers can enable basic automation and monitoring.

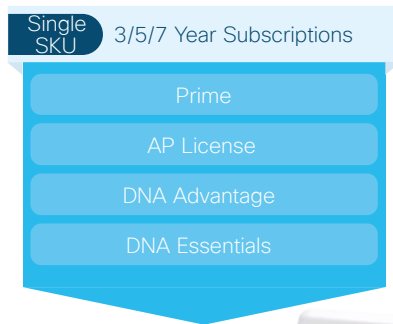
■ DNA for Wireless: Subscription Offer Structure

## DNA for Wireless: Subscription Offer Structure

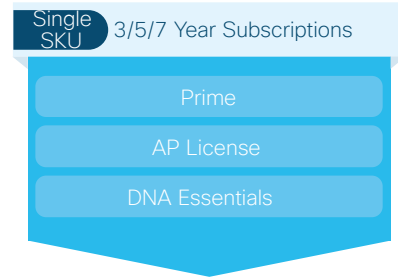
### Cisco ONE Advantage



### DNA Advantage



### DNA Essentials



Wave 2 Aironet AP's and Controllers – 3504, 5520, 8510 and 8540

Software Support included in all subscriptions

■ Cisco DNA for wireless subscription

- The new Cisco DNA subscription for wireless is available on Wave 2 Aironet® access points and controllers – 3504, 5520, 8510 and 8540
- Software subscription is offered as a 3-, 5-, or 7-year term

**Cisco ONE advantage** delivers policy-based automation with SD Access, Cisco DNA assurance, security, and location-based capabilities. Additionally, you can purchase Stealthwatch license as an add-on option for wireless.

**Cisco DNA advantage** delivers policy-based automation with SD Access, monitoring, and Cisco DNA Assurance.

**Cisco DNA essentials** delivers base automation, monitoring, and management.

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# Financing

Cisco Capital



## The Network Intuitive enables innovation, risk reduction, increased productivity, and accelerated new operations models.

Cisco Capital's\* upgraded financial solutions portfolio can help you get the most out of the Network Intuitive with a range of finance options starting from \$1,000, from spread payment and lifecycle management to pay-per-use.

Add the Flexible Finance offers to all sales proposals for Cisco hardware, software, services, and third-party solutions, and start benefiting.

### Benefits for partners and distributors



#### Close more deals

- Overcome objections about limited or unavailable budgets



#### Trigger repeat purchase

- You are first in line for the next sale when the initial financing term expires



#### Get your money faster

- You will receive your payment as soon as the customer accepts the order

Partners earn 1% rebate on every deal financed with **easylease**\*\*

\* Financing products, applicable lenders, and availability of any referenced programs will vary by country. Cisco Capital offers leasing and/or financing in a limited number of countries. Leasing and/or financing may be provided by an independent financing vendor in jurisdictions where Cisco Capital does not offer the applicable leasing and/or financing products. Other restrictions may apply. Cisco Capital reserves the right to change or cancel the foregoing at any time without notice.

\*\* To apply for rebate, go to [www.cisco.com/go/ppc](http://www.cisco.com/go/ppc) and select Eligible Programs tab, then search for the EMEA Partner Incentive Program

### Flexible Finance<sup>1</sup> offers at a glance

Every IT project is unique. Select the offer that best fits your customer's requirements.

Offers	easylease 0%	Commercial Payment Options	Easy Pay 0%
If your customer invests from	\$1,000 to \$250,000 <sup>2</sup>	\$250,000 to \$2M <sup>2</sup>	\$150,000 to \$10M <sup>2</sup>
Lease duration	36 months	36, 48, or 60 months	36 months
Technology eligibility	All Cisco technology, including hardware, software, and services. <sup>3</sup>		
Minimum Cisco spend	70% of total price		90% of hardware purchase price and 100% of software & services (max 70% of BOM)
Other requirements	10% Cisco, up to 30% third-party costs <sup>4</sup>	70% Cisco & Strategic Alliance, up to 30% third-party costs <sup>4</sup>	30% hardware and up to 10% third-party costs <sup>4</sup>
End-of-lease options	Purchase or return	Purchase, return, or refresh <sup>5</sup>	
If your deal falls outside of these parameters	Contact your local Cisco Capital partner account manager		
Key customer benefits	Spread payments over 36 months at true 0%	Defer technology refresh decisions with certainty of future costs	0% or better financing to ease migration to new Cisco technology

#### Tailor-made solutions

We can design a suitable financing solution to help your customers streamline the way they manage their technology investments. Whether it is a lease, loan, or on-demand consumption model, Cisco Capital has a highly experienced team of financing consulting experts who are dedicated to supporting your business.

- Financing products provided by third-party financiers. Participating countries' terms and conditions apply. Credit approval required by finance partner.
- Or the equivalent in local currency.
- All Cisco products qualify for Easy Pay with the exception of Cisco End of Life (EOL) products.
- Third-party costs include installation, support, and third-party noncompetitive hardware.
- End-of-term buy-out options where available in accordance with local policies.

### Let us help you sell more

- Talk to your dedicated Cisco Capital partner account manager: <http://cs.com/9008DE2wK>
- Email us at [cisco\\_capital\\_channel\\_partners\\_emea@cisco.com](mailto:cisco_capital_channel_partners_emea@cisco.com)





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**Financing**

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# Cisco Services

## Grow your network deals with Cisco Services

If you want your customers to get the best experience from their investment in Cisco solutions, you can't just sell them technology products. You need services to bring those products to life and deliver business outcomes, faster.

Did you know? Already 50% of Cisco partner revenue, and 56% of partner profit, comes from selling Cisco services.

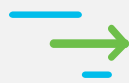
### ■ With you every step of the way

Cisco Services is there to work shoulder-to-shoulder with you at every stage of your customers' projects. To support the Network. Intuitive, we offer services in six broad capabilities. Check out [Cisco.com](http://Cisco.com) or [SalesConnect](http://SalesConnect) for the full list.



#### Advisory

- **DNA Advisory for SD-Access**  
Develop an architecture strategy and roadmap tailored to customer needs
- **SD Access Design**  
Identify and validate design requirements early on
- **Security Segmentation**  
Reduce risk with a strategic infrastructure segmentation approach



#### Implementation

- **DNA Center Advise and Implement**  
Ensure rapid deployment of DNA Center
- **SD-Access Solution Validation**  
Get rapid prototyping and validation in a tab early on
- **SD-Access Migration**  
Migrate with high performance, security and reliability
- **SD-Access Operations Planning**  
Prepare to effectively operate and manage SD-Access solution



#### Optimization

- **Business Critical Services**  
Achieve operational excellence as the network grows and changes



#### Managed

- **Managed Enterprise for SD-Access**  
Get proactive monitoring and management to maintain network performance and uptime



#### Technical

- **Smart Net Total Care**  
Reduce downtime with fast, expert technical support and flexible hardware coverage
- **Partner Support Service**  
Partners drive incremental revenue with their own branded service backed by Cisco hardware support capabilities and insights
- **Solution Support**  
Maintain reliability and ROI through centralized support across the solution ecosystem



#### Better Understand

- **SD-Access Training**  
Better understanding SD-Access and its key solution components
- **DNA Implementation Essentials**  
Learn best practices in deploying SD-Access solutions
- **Network Programmability Specialist Certifications**  
Develop comprehensive skills required to manage today's networks

## Three ways to capture new opportunities with services

- 1 **Get your customers on the right path to DNA** – check out our advisory services. You can start with our **DNA Advisor program**, (<http://cs.co/9001D8GJ1>) then draw on our consultants to deepen the engagement.
- 2 **Wow them with predictive analytics** – look at **Business Critical Services** (<http://cs.co/9008D8Gm2>). It gives your customers a near real-time dashboard of how their networks are performing, and can give you insights to build your account strategy.
- 3 **Make now the time for uptime** – discover **Solution Support** (<http://cs.co/9002D8GWu>), the preferred technical services option for Network. Intuitive. When a complex issue occurs, we take ownership from start to finish and drive 43% faster resolution than product support alone.

### ■ Good for you, good for your customers

Selling services helps you:

- **Win bigger deals.** Services are high margin and vital for project success – don't give your customers a reason to buy them from somewhere else.
- **Complete projects faster.** Services can help you move from first call to go-live more quickly, avoiding re-scoping, integration problems and troublesome post-sale escalation calls.
- **Make customers happy.** With services, customers get full value from the products they've bought from you, more quickly. Our data shows that services customers have higher Net Promoter Scores. And happy customers come back.
- **Create new business.** Services engagements uncover opportunities for follow-on deals. They're the ultimate consultative sales tool.

### ■ Services your way

We're committed to your success, so you can build Cisco-branded services into your networking proposition in several ways:

- **Resell:** Cisco Services have never been easier to transact, you need no specialisations to sell them, and you can start benefitting right away as part of the **Cisco Services Partner Program** ([www.cisco.com/go/cspp](http://www.cisco.com/go/cspp)). We offer incentives, rewards, and best practices to drive business growth, as well as typical gross margin of 18-25%.
- **Ramp up:** If you have your own established services practices, you can use Cisco Services to help your customers adopt the latest and most complex

Cisco technologies while your in-house consultants and engineers get comfortable. You can even draw on our **Partner Design and Implement Technical Advisors** (<http://cs.co/9004D8Gow>) for free expert assistance to answer questions when you're working on implementing new Cisco products for your customers.

- **Fill gaps:** Perhaps you're well resourced in network design and implementation but don't have the right people to offer security testing or solution validation? Avoid the cost and risk of building out broader services capabilities: focus on your core value and leave the rest to us.

If you see services playing a bigger role in your value proposition going forward, for qualified partners we can help you build your own partner-branded services capabilities too, including **Partner Support Service** (<http://cs.co/9002D8Go2>) and **Distributor Support Service** (<http://cs.co/9000D8GU6>).

## Learn more about services

- For more information on Cisco Services for partners, check out [SalesConnect](http://SalesConnect): [salesconnect.cisco.com/#/program/PAGE-5699](http://salesconnect.cisco.com/#/program/PAGE-5699)
- And for the latest on our services for enterprise networks, see: <http://cs.co/9000D8GUo>



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# Cisco Programs and Promotions

Helps you win deals and increase your profitability

## Enterprise Networks Dynamic Offers

This offer is a simple and automatic dynamic discount model to accelerate and simplify the sales cycle for Cross Selling switching, routing and wireless products into one deal. One bundle does not fit all customers and the EN Dynamic offers enable you to build the right bundle for your customers.

Get all the information on the Enterprise Networks Dynamic offers:

[www.cisco.com/go/dynamicoffers](http://www.cisco.com/go/dynamicoffers)

## Enterprise Networks Account Breakaway

Accelerate your customer's digital transformation while increasing your profitability with EN Account Breakaway.

Enterprise Networks Account Breakaway rewards partners for developing and selling into new accounts or accounts that have not bought strategic Enterprise Networks products in the last two years.

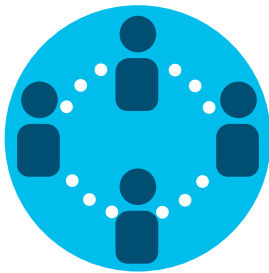
For all the information on product eligibility and Terms and Conditions go to:

[www.cisco.com/go/ab](http://www.cisco.com/go/ab)

## Deal Registration Incentives:

### ■ Migration Incentive Program:

Migrate to our new solutions. Get rewards.



#### Migration Incentive Program

- Offer customers discounts and enjoy a VIP Migration Bonus when you move them to new technologies and return old equipment.



#### Replace competitive products

- Help your customers get rid of the competition's old equipment. Replace it with our new solutions. Enjoy the rewards.



#### Earn more with our technologies

- Move your customers to our solutions and make their networks digital ready. Earn extra discounts along the way.

## Hunting Incentive

### ■ Opportunity Incentive Program

## Opportunity Incentive Program

#### Qualified partners

- Gold, Premier, Select Certified Partners
- Master, Advanced, Express Cloud, and Managed Services Partners
- Global and Multinational Certified Partners

#### Qualified opportunities

- Each opportunity must be net-new. It cannot be facilitated by Cisco or another channel partner, listed in the Cisco sales forecast, or previously qualified or approved.

#### Eligible products

- All products on the Cisco Global Price List are available, except for SolutionsPlus products, incentive-restricted SKUs, and refurbished equipment.

#### Availability

- Never miss a registration window. The Opportunity Incentive Program is available on an ongoing basis.

## Value Incentive Program

The Value Incentive Program (VIP) is a back-end payment that can help increase partner's profitability and reward partners who focus their business practices on Cisco's major architectures and emerging offerings.

For information about Program rules, eligibility and list of applicable SKUs, go to: [www.cisco.com/go/vip](http://www.cisco.com/go/vip)

For a complete view of all Programs and Promotions, go to: <http://cs.co/9007DEDJW>

Enterprise Networks Account Breakaway rewards partners for developing and selling into new accounts or accounts that have not bought strategic Enterprise Networks products in the last two years.

For all the information on product eligibility and Terms and Conditions go to: [www.cisco.com/go/ab](http://www.cisco.com/go/ab)

### ■ Opportunity Incentive Program

<http://cs.co/9007DEDYX>





POLYPHONIC  
SPACE FOR  
CULTURE




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Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

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